

THE UNIVERSITY OF ALBERTA
A REVIEW OF LEGISLATION PERTAINING TO PETROLEUM RESOURCES:
GOVERNMENT OF ALBERTA
1930 - 1957

A DISSERTATION
SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF ARTS

FACULTY OF ARTS AND SCIENCE
DEPARTMENT OF POLITICAL ECONOMY


BY
Harold Emory Bronson

EDMONTON, ALBERTA

1 September - 1958

Ex libris
UNIVERSITATIS
ALBERTAENSIS





Digitized by the Internet Archive
in 2017 with funding from
University of Alberta Libraries

<https://archive.org/details/reviewoflegislat00bron>

thesis
1958(F)
#1

THE UNIVERSITY OF ALBERTA

A REVIEW OF LEGISLATION PERTAINING TO PETROLEUM RESOURCES:

GOVERNMENT OF ALBERTA

1930 - 1957

A DISSERTATION

SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS

FACULTY of ARTS and SCIENCE

DEPARTMENT of POLITICAL ECONOMY

BY

Harold Emory Bronson

EDMONTON, ALBERTA

1 September - 1958

ABSTRACT

A Review of Legislation Pertaining to Petroleum Resources, Government of Alberta, 1930-1957.

In 1930, the natural resources of Alberta came under provincial jurisdiction after 25 years of Dominion administration. The change was accompanied by considerable controversy over alleged losses to the Province as a result of alienation of mineral rights. These rights took on new value when it became evident that Alberta had great potential as a producer of oil and natural gas.

There was also difference of opinion regarding Dominion effectiveness in preventing unnecessary losses of oil and gas. The Albert administration at once faced the task of trying to improve the standards of conservation which had previously prevailed. Much gas had been flared in early years, but this was not necessarily to be classified as waste. Such losses had to be balanced against the general loss to society if development of the resource had been deferred until there was a market for the gas which, at the time, was largely a surplus by-product of eagerly sought naphtha.

The Province's early conservation legislation was hindered by the fact that voluntary agreement to the curtailment of flow necessary to prevent premature exhaustion of the Turner Valley field was not forthcoming from all operators. Many independent producers depended on full flow to meet expenses. Eventually the government had to set up regulatory Boards with powers which were termed "dictatorial," in order to safeguard the resource in the public interest.

This situation prevailed throughout the depression of the 1930s, but was greatly changed during World War II. Urgent demand for oil shifted the emphasis from curtailment of flow to maximum production. Widespread urban conversion from coal to gas greatly improved the market for the latter com-

ABSTRACT (continued)

modity.

In the post-war period, new geophysical techniques made essential a revision of leasing systems for exploration and drilling. These new methods assisted in the discovery and expansion of the new fields around Leduc, Redwater and Pembina. Eventually supplies expanded to the point where marketing became the foremost problem. Prorationing of production to market demand became necessary to the extent that output was reduced to less than half the maximum capacity of the fields.

Urgent action was taken to promote export of gas and oil. Legislation was designed to assist the development of local pipeline grids and trans-continental lines. There was accompanying controversy over the ownership of these new facilities and over the retention of reserves for local use.

With such a variety of circumstances, Alberta legislation pertaining to petroleum resources required frequent and extensive adjustments. Often, the decisions had to be based on estimates of future conditions which could not be assessed accurately. Accordingly, the many possible criticisms must often wait for future developments to determine their validity.

ACKNOWLEDGMENTS

Several people have contributed directly or indirectly to this study. Their assistance is gratefully acknowledged.

Special thanks are due Dr. E. J. Hanson and Mr. G. R. Davy for their helpful advice, criticisms and patience, and to a number of their colleagues, particularly Dr. G. W. Govier and Dr. D. Quon. Grateful appreciation is also due Dr. H. H. Somerville and Mr. C. W. Jackman for the information which they so readily supplied.

Sole responsibility for all views expressed, and for any error, is that of the author.

(Harold Emory Bronson)

September, 1958.

TABLE OF CONTENTS

Abstract	
Acknowledgments	
Table of Contents	
List of Tables	
Chapter 1. The Transfer of Public Lands	1
Chapter 2. The Development of Alberta's Petroleum Potential	17
Chapter 3. Provincial Administration of Oil and Gas Resources	28
Chapter 4. Concepts of Conservation and Proration	37
Chapter 5. Conservation Prior to 1947	51
Chapter 6. Post-Leduc Conservation and Proration	78
Chapter 7. Land Policies	92
Chapter 8. The Export of Natural Gas	104
Chapter 9. Summary	118
Bibliography	127

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Alberta Revenue from the Federal Treasury	3
2	Dominion Credits Claimed with Relation to Administration of Alberta Resources, 1905-1930	11
3	Alienation of Alberta's Surface Rights between 1905 and 1930	12
4	Alberta Oil and Gas Wells - Footage Drilled in Five Year Periods, 1927-1946	22
5	Wells Completed, Oil Wells Capable of Being Operated, and Total Footage Drilled, 1946-1957	25
6	A Chronological Summary of the Major Oil and Gas Discoveries and Developments in Alberta from 1884 to 1957	26
7	Ratio of Dry Gas to Naphtha in Turner Valley, 1925-1932	54
8	Comparison of Alberta Gas Withdrawn to Gas Marketed up to 1947	57
9	Acreages of Permits and Reservations Granted, 1938-1946	77
10	Alberta Crude Oil Production by Calendar Years, 1937-1949	78
11	Summary of Shipments of Alberta Crude Oil, 1947-1953	83
12	Production, Consumption and Shipments of Petroleum Fuels into and out of Alberta, 1947-1953	83
13	Distribution of Mineral Rights, Alberta, 1930	95
14	Disposition of Alberta Natural Gas, 1951-1956	115
15	Comparison of Alberta Mineral Rights Held Freehold with Mineral Rights Held by the Crown	118

CHAPTER 1

THE TRANSFER OF PUBLIC LANDS

The political and economic circumstances applying to the Canadian prairies during the latter part of the nineteenth century have had their effect on Alberta legislation pertaining to petroleum resources. The central factor in these circumstances was the initial retention of the prairie natural resources by the Dominion, involving the areas of Manitoba, Saskatchewan, Alberta, and large areas of the Peace River block in British Columbia.

The three prairie provinces differed from British Columbia, however, in that they had no existence prior to their entries into Confederation, and therefore came into being without ever having possessed their resources. British Columbia, on the other hand, was organized nine years before the British North America Act, and entered Confederation retaining its resources except for those which it voluntarily conveyed to the Dominion in the interests of railway building. The prairie provinces were thus in a stronger position to register the protests which they eventually developed, alleging certain disadvantages to themselves as a result of the Dominion control of their resources.

It is not easy to estimate how Alberta petroleum development and legislation would have been affected if the Province had been given control of its resources from the time of its formation in 1905 until it actually received the control in 1930. The best that can be done in this analysis is to note some of the most important arguments put forward by spokesmen for the Dominion and for the Provinces during the controversies which developed over the natural resources question.

The Dominion had first possession of the disputed resources by virtue of the surrender of Rupert's Land to the British Crown in 1868 by the Hudson's

Bay Company, and the subsequent cession of Rupert's Land and the North-West Territories to Canada by Imperial Order-in-Council of June, 1870. When Manitoba was brought into Confederation that same year, and when Alberta and Saskatchewan followed in 1905, the Dominion broke the precedent by which all the other Provinces controlled their own resources. The prairie public lands "were to be administered by the Government of Canada for the purposes of the Dominion."

Of these "purposes of the Dominion" two transcended all others - railways and settlement. Those public lands were to provide the railways which would link the scattered regions of the Dominion and were to encourage the settlement which would in turn support the railways and give stimulus to the older regions.¹

Alberta and Saskatchewan, from their beginning, received an annual cash subsidy in lieu of the resources, while Manitoba waited 12 years after entry before receiving such assistance. Alberta's subsidy in lieu of land, like Saskatchewan's, was based on an estimate of 25,000,000 acres of arable public land, an assumed value of \$1.50 an acre for this land. On this estimated value of \$37,500,000 the federal government was to pay 1 per cent until the population reached 400,000, then 1½ per cent up to a population of 800,000, 2 per cent until 1,200,000 was reached, and thereafter 3 per cent.² The acreage, the valuation and the percentage to be paid were later struck out of the

1. Government of Canada, The Economic Background of Dominion-Provincial Relations (A Study Prepared for the Royal Commission on Dominion-Provincial Relations) (Ottawa, 1939) 15 (Hereafter cited as The Economic Background of Dominion-Provincial Relations.)

2. J. A. Maxwell, Federal Subsidies to the Provincial Governments in Canada (Cambridge, 1937), 122.

legislation because they represented a combination of guesswork and arbitrary valuation, but the amount of the subsidy remained, "resting on no explicit basis." Actually, the amount represented "...the estimated fiscal needs of the new provinces,"³ when combined with other grants and allowances, which are indicated in the following table.⁴

TABLE 1

Alberta Revenue from the Federal Treasury, (1905-06).

Grant for government.....	\$50,000	
80-cent subsidy per capita.....	200,000	
Interest on debt allowance.....	405,375	
Subsidy in lieu of land.....	375,000	
Building allowance.....	<u>93,750</u>	\$1,124,125.

Except for minor adjustments in the per capita subsidy, these terms remained in effect until the transfer of resources in 1930. The provincial revenue expanded on the basis of population growth. It was hoped by the federal authorities that such financial arrangements would be acceptable to the Province as a substitute for possession of the natural resources.

For a time, there seemed to be some chance of this hope being fulfilled. For although economic difficulties and political discontent had driven Manitoba's Premier Norquay to press for return of that Province's resources in 1884, the conditions at the time of Alberta's formation put other issues in the forefront. After 1896 the settlement boom in the Northwest Territories

3. J. A. Maxwell, Federal Subsidies to the Provincial Governments in Canada (Cambridge, 1937), 123.

4. Ibid., 124.

had concentrated demands on the obtaining of provincial status and of larger federal grants. With the achievement of these in 1905, the main concern for the time being was the application of the new revenues to rapid expansion of roads, railways, telephones, schools and other public services. While the Conservatives under Bennet raised particular objection to federal retention of the domain, the Liberals declared

...that federal retention of the domain, coupled with a generous subsidy in lieu of it and a progressive settlement policy, was distinctly advantageous to the prairie provinces. The electors of both provinces appeared to endorse this view.⁵

This reference is to the election of Liberals Walter Scott and A. C. Rutherford to head the first governments of Saskatchewan and Alberta, respectively. As in any election, it is difficult to ascribe the result to any one issue, but

In those elections, control of the resources was an important, though not the only, issue before the electorate, and the election results may properly be construed as provincial approval of the scheme.⁶

Whatever the extent of electoral approval for retention of the resources by the Dominion may have been at these first elections, it is apparent that such support deteriorated in the first years of provincial administration. Expansion took place so rapidly that it soon strained the Alberta finances which had at first seemed so abundant. The change which this situation brought about in the attitude toward the resources is indicated by the actions of both Liberals and Conservatives in the Province.

The Conservatives had continued their campaign for provincial control

5. Maxwell, op.cit., 125.

6. Government of Canada, Report of the Royal Commission on the Natural Resources of Alberta (Hon. A. K. Dysart, Chairman) (Ottawa, 1935), 13.

of the resources after the 1905 elections. Sir Robert Borden proclaimed that "they (the provinces) are entitled to the control of these lands just as much as the people of the eastern provinces."⁷

Although Borden thus campaigned for the return of the domain, he did not take action in this direction when he was elected in 1911. He confined his legislation to attempts at reaching equalization of the subsidies between the provinces.

The Liberals, however, showed that they recognized a change in popular sentiment. Premier Sifton, newly elected in Alberta, joined with Scott of Saskatchewan to argue for return of the resources to the provinces, coupled with continuance of the federal subsidy and compensation for land already alienated. Whether or not they actually wished return of the resources, they nevertheless made demands which were certain to be embarrassing to Prime Minister Borden.

The prairie provinces wanted to have their cake and eat it as well. Nor can there be any doubt that Sifton and Scott expected their proposal to be refused. What they wanted was to forestall action by Sir Robert Borden.⁸

The result was a stalemate until after World War I. Then, immediately, demands began in new form, with Manitoba taking the lead. Prime Minister Arthur Meighen found himself facing the argument that federal control of the resources was contrary to British principles. Chester Martin, presenting a case for Manitoba, argued that responsible government implied provincial control of the public domain and that this principle applied "to all the self-governing provinces and Dominions of the Empire, in fact but the Prairie Provinces of Canada."⁹

7. Chester Martin, The Natural Resources Question (Winnipeg, 1920), 15.

8. Maxwell, op. cit., 149.

9. Martin, op. cit., 15.

Maxwell, however, denied this theory, pointing out that where provincial control of the domain was practiced, the reason was expediency and not principle. The imperial government had often considered retention of overseas resources, but refrained because of possible need to pay subsidies, and because of the impracticability of exercising effective control. Thus he describes Martin's analogy drawn between imperial and Canadian policies as 'illusory,' because Canada "gave subsidies in lieu of land and could exercise an effective control..."¹⁰

The Liberal government elected in 1921 under Mackenzie King took the same practical position as had the Conservatives under Borden, by rejecting the idea of returning the resources and at the same time paying subsidies on them. At this time, because Alberta was beginning to get a glimpse of her potential resources through such discoveries as the natural gas and petroleum in Turner Valley, she felt prepared to negotiate with the Dominion on the basis of getting the resources while accepting reduction or elimination of subsidies. Alberta thus parted company with the other two prairie provinces which continued to use their constitutional arguments as a "subterfuge"¹¹ to induce better federal grants, knowing "that possession of their natural resources, coupled with loss or diminution of subsidy, would bring burden rather than relief to their treasuries...."¹²

Alberta actually took the initiative in promoting her new position. In 1920 the government submitted a statement "that Alberta would be quite willing to pay back to the Dominion all that it had received in the way of

10. Maxwell, op. cit., 151.

11. Ibid., 152.

12. Ibid., 152.

subsidies and grants" if the Dominion would account for and pay what it had gained from the Province "on the basis that this Province should have received its resources in 1905."¹³

Financial problems added to the strength of demands by the Province for Dominion concessions. Heavy capital costs were causing an increase in the public debt, to the point that there was "an increase in fixed charges, alone, of \$870,000 - this being the increase in the interest on Public Debt, exclusive of Telephones." The Public Accounts "gave an excess of ordinary Expenditure, in 1921, over Revenue of \$2,022,367;..."¹⁴

After intensive negotiation, Alberta proposed that the remaining resources should be returned to the Province with the following conditions:

Present Subsidy to be waived on condition that compensation be given for resources alienated from the Province of Alberta for purely Federal purposes. Claim principally made being for compensation for 6,400,000 acres of Alberta lands alienated, just prior to the formation of the Province, for subsidizing the construction of railways outside the Province of Alberta. These lands to be capitalized at a figure to be agreed upon and the amount paid over to the Province over a term of years.¹⁵

The Federal Government, under Mr. King, declined this settlement, offering instead the return of remaining resources plus payment of existing subsidies for three years. All three prairie Provinces refused this offer and a stalemate ensued.

Premier Greenfield of Alberta had estimated that the 6,400,000 acres of alienated land, capitalized at \$1.50 an acre "would just about equal the present cash subsidy for 10 years, instead of the three years offered by Mr. Mackenzie King."¹⁶ The Premier was not satisfied with the net return which

13. Castell Hopkins, The Canadian Annual Review, (1920) (Toronto), 794.

14. Ibid. (1922), 815.

15. Ibid. 221.

16. Ibid. 807.

...the ... of the ...
...the ... of the ...
...the ... of the ...

...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...

...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...

...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...

...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...

...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...
...the ... of the ...

mere acquisition of the remaining resources appeared to offer. He noted that "the Department of the Interior in 1919-20 had spent on these lands \$1,304,312 and only received \$1,805,312;".¹⁶ The inadequacy of this balance accounted for Alberta's insistence on compensation for the alienated lands.

While agreement was still suspended, the demands on the Province and on the municipalities for improved services continued to increase. This was a result, not only of the expansion and consolidation of settlement, but also of the accumulated, deferred demands from the war years.

Even the older Provinces with their well settled and well established populations which had long since passed the colonization state, found great difficulty in meeting these new demands out of ordinary revenue.¹⁷

The Dominion's reluctance to comply with Provincial requests was increased as a result of the combined effects of "rash railway policies"¹⁸ and war expenditures.

In seven years, the public debt of the Dominion increased sevenfold. The Dominion was reluctant to undertake new responsibilities, and this paralyzing debt became the financial counterpart of the political weakness which fell upon the Dominion.¹⁸

New discoveries in Turner Valley in 1924 added further attractiveness to the revenue-producing possibilities of the Alberta resources. By 1926 the Province was negotiating on conditions previously rejected, the receipt of "its unalienated domain and a continuance of the land subsidy for a period of three years."¹⁹ Agreement was disrupted when Quebec Members of Parliament

16. Castell Hopkins, The Canadian Annual Review, 1922, 807.

17. Government of Alberta, The Case for Alberta, Book I, (Edmonton, 1938), 44-45.

18. Government of Canada, Report of the Royal Commission on Dominion-Provincial Relations, Book I (Ottawa, 1940), 111.

19. Maxwell, op. cit., 153.

raised the issue of safeguarding the educational rights of Alberta's Catholic minority. "At even the vague prospect of revival of a sectarian dispute both the provincial and the federal government turned tail precipitately, and the impending legislation was dropped."²⁰

In 1929 the House of Commons passed a resolution favouring return of the resources to the Prairie Provinces with the various provincial claims to be "investigated with a view to satisfactory and equitable adjustment."²¹ The Alberta Legislature followed up this resolution with one of its own, deciding that it should "again interview the Government of Canada in an effort to arrange this year satisfactory terms upon which the Natural Resources may be returned to this Province."²²

The problem was to devise a formula for evaluating the alienated resources. Could the provinces have obtained more revenue from homesteads? Would they have attained more revenue from the natural resources? Would Alberta, for example, have developed oil and gas more efficiently? Prime Minister Meighen described the problem as being the equivalent of trying to unscramble an egg.

Alberta reached an agreement with the Dominion in December, 1929, after Manitoba's negotiations had for the first time brought forth a federal admission that its retention of the resources might have placed the provinces concerned in a position of inequality with the rest of Canada. The Turgeon Commission had sought to re-establish Manitoba's equality by adopting a formula

20. Maxwell, op. cit., 153.

21. Castell Hopkins, The Canadian Annual Review (1928-29), 51-52.

22. IBid., 494.

similar to that used for Alberta and Saskatchewan in 1905.²³ Alberta's agreement also called for equality with other provinces, by means of obtaining its unalienated resources, continued receipt of land subsidy without alteration, and a Royal Commission to decide if further compensation should be given.²⁴ Later, following Saskatchewan, a reservation was made concerning the Dominion's constitutional justification in holding the lands except in trust, but this claim was rejected by the Privy Council.

In 1934 the promised Royal Commission set out to make a final accounting, with the main idea of putting the Province in the position it would have been in if it had possessed the resources since 1905. This meant comparing actual Dominion achievements with hypothetical Provincial achievements, the latter representing the unscrambling of the egg. In this task the Commission was unsuccessful, even after analysis of much evidence.

...a real accounting had not been achieved. The Dominion credits were, in the main, easily assessed. But the debts were not, and the commissions nowhere ventured to set a precise evaluation upon the financial loss suffered by Saskatchewan and Alberta...²⁵

The Dominion credits claimed included past subsidies, subsidies to be paid in the future, administrative expenses, revenues from school lands obtained by the Dominion and turned over to the Province, and aid in construction of branch line railways.

23. Cf., above, 3.

24. Maxwell, op. cit., 163.

25. Ibid., 172.

TABLE 2

Dominion Credits Claimed with Relation to Administration of Alberta
Natural Resources, 1905 - 1930²⁶

Past Subsidies, 1905 - 1930.....v.....	\$12,750,000
Future Subsidies, (present value as at 1930, assuming future pop- ulation of 1,200,000 and an interest rate of three per cent).....	29,000,000 ²⁷
Administrative expenses.....	30,000,000 ²⁸
School Land Revenue.....	<u>20,070,000</u>
Total.....	\$91,820,000.

Regarding the Dominion claim for several million dollars in connection with branch line railways, the Commission pointed out that similar lines had been built in other provinces, and that Alberta should not be asked to reimburse the Dominion for this unless the other Provinces were called upon to do likewise.

The Dominion had not been unrewarded for its expenditures. The "purposes of the Dominion", unification of the country by railways and by settlement, had largely been achieved, with inestimable ultimate value to the country as a whole. In addition, although not aiming for production of revenues, the Dominion obtained from Alberta over \$32,000,000 in the 1905-1930 period.²⁹

26. Government of Canada, Report of the Royal Commission on the Natural Resources of Alberta (Ottawa, 1935), 35.

27. The Commission felt that there were too many uncertainties involved to regard this amount as a hard-and-fast figure.

28. The Commission felt this amount to be excessive because it included items which provincial administration might have reduced.

29. Government of Canada, Report of the Royal Commission on the Natural Resources of Alberta (Ottawa, 1935), 26.

What might have been attained under policies designed not for settlement alone, but for settlement and revenue, is difficult to estimate, but assuredly substantial increases of revenue might have been expected.²⁹

There was a variety of matters concerning which provincial policies, designed to produce revenues, might have done so on a scale greater than that achieved by the Dominion. The main items, however, related to the alienation of surface rights and to the alienation of under-rights.³⁰ Commitments which the Dominion entered into before September 1, 1905 and which subsequently were honoured, were not considered, since such rights would have been lost to the Province in any case. About 7,000,000 acres were alienated after 1905, which were in fulfillment of commitments prior to that date.³¹

Similarly, commitments entered into before October 1, 1930, but not completed until after that date, are included unless they were later abandoned. With these provisos, the following estimate was made of surface rights alienations:

TABLE 3

Alienation of Alberta's Surface Rights between 1905 and 1930.

(a) To Settlers, -	<u>acres</u>
Free homesteads.....	15,800,000
Pre-emptions.....	1,700,000
Purchased homesteads.....	280,000
(b) To soldiers as bounties, -	
South African Veterans.....	1,000,000
Great War Veterans.....	750,000

29. Government of Canada, Report of the Royal Commission on the Natural Resources of Alberta (Ottawa, 1935), 26.

30. "Alienation" is defined by the Commission as describing land committed to be, or actually given away or sold. Leasing is not termed alienation in the full sense.

31. Government of Canada, Report of Royal Commission on the Natural Resources of Alberta (Ottawa, 1935), 21.

(c) Various other uses, including some half-breed grants.....	770,000
(d) School lands.....	1,240,000
(e) National parks (Dominion).....	13,435,000
(f) Lands for various charitable, religious and community purposes.....	<u>75,000</u>
Total.....	35,050,000

The last three items are ones "for which the province either makes no claim at all or has no right to claim on grounds of alienation."³² Maxwell's estimates for the 1905-1930 period include 2,396,800 to railways, and 1,016,800 acres to the Hudson's Bay Company,³³ while the Royal Commission omits these amounts either as having been committed prior to 1905, or as otherwise beyond possible provincial claim.³⁴ At any rate, in spite of minor differences due to classification or timing, there is agreement that the total alienations in the 1905-1930 period exceeded 42,000,000 acres,³⁵ out of a total surface area of 163,000,000 acres.³⁶

With respect to under-rights, the alienations during the 1905-1930 period were nearly 4,700,000 acres, most of which were committed before 1905.³⁷ Although in terms of acreages, the under-rights alienations in Alberta were "far below" those of Manitoba and Saskatchewan, they were "much more" than

32. Government of Canada, Report of Royal Commission on the Natural Resources of Alberta (Ottawa, 1935), 21.

33. Maxwell, op. cit., 169.

34. Cf. above, 12.

35. Government of Canada, Report of the Royal Commission on the Natural Resources of Alberta (Ottawa, 1935), 34.

36. I. Funk and A. Wagnalls, Universal Standard Encyclopedia (New York, 1954), 138.

37. Government of Canada, Report of Royal Commission on the Natural Resources of Alberta (Ottawa, 1935), 22.

for those two sister Provinces when calculated in terms of mineral quantity and value.³⁷ This estimate was mainly true because of the inclusion of coal, petroleum and natural gas in the mineral wealth category.

The Commission expressed the view that it had the fullest information regarding all aspects of these resources, and that it examined the various technical questions such as the waiving of rentals in encouragement of drilling operations, and the ways in which Provincial administration might have differed from that of the Dominion. They found little fault with Dominion administration from the federal standpoint; "yet it embodied some features - chiefly in respect to the development of petroleum and natural gas areas - which the province, guided by its need for revenue, would probably not have followed."³⁸ Consequently it was felt that Provincial administration would have obtained revenues "considerably larger" than those obtained by the Dominion from the mineral resources.³⁸

The Commission got no further than such general phrases in estimating what Provincial policies might have done. Lacking mathematical estimates, which would have led to "endless variation, and, consequently, to endless controversy",³⁹ it finally quoted with approval the recommendation made in 1921 by Arthur Meighen:

"You may get further by one way and one way only, by presenting some concrete proposal in figures, that will appeal to a fair-minded man as a square, bald, rough but honourable solution."⁴⁰

37. Government of Canada, Report of Royal Commission on the Natural Resources of Alberta (Ottawa, 1935), 22.

38. Ibid., 33.

39. Ibid., 38.

40. Ibid., 37.

The Commission expressed the view that it was a pity that the Commission had not been able to carry out its task in a more effective manner, and that it was necessary to take steps to improve its work.

The Commission expressed the view that it was a pity that the Commission had not been able to carry out its task in a more effective manner, and that it was necessary to take steps to improve its work.

The Commission expressed the view that it was a pity that the Commission had not been able to carry out its task in a more effective manner, and that it was necessary to take steps to improve its work.

The Commission expressed the view that it was a pity that the Commission had not been able to carry out its task in a more effective manner, and that it was necessary to take steps to improve its work.

The Commission expressed the view that it was a pity that the Commission had not been able to carry out its task in a more effective manner, and that it was necessary to take steps to improve its work.

The Commission's proposal was that the Dominion should pay Alberta the sum of \$5,000,000 which,

...when added to all the purely provincial benefits that Alberta has received or is yet to receive from the Dominion in respect of its resources will, in our judgement, balance the amount of net revenue which the province would probably have obtained from those portions of its resources alienated or otherwise disposed of by the Dominion during the course of its twenty-five year administration.³⁹

The terms of reference of the Commission recalled the 1929-30 arrangement that all governments concerned were to be in agreement before acceptance of the report. While Alberta showed agreement with the Dominion, Saskatchewan showed doubts as a result of the dissenting vote of H. V. Bigelow, one of the members of the Saskatchewan Commission which made recommendations similar to those for Alberta. Bigelow presented arguments to show that Saskatchewan should get over \$58,000,000, and this had enough appeal to cause both Provinces to defer acceptance of the Commission conclusions.

In the meantime, Provincial finances became more precarious all across Canada, mainly because of the economic depression. Agitation for federal subsidies based on fiscal need developed. Mackenzie King's 1937 Rowell-Sirois Commission attempted with little success to replace piecemeal adjustments with a final settlement of all Provincial claims against the Dominion.

World War II brought about agreement on a system of tax rentals payable by the Dominion to all Provinces, and similar arrangements continued with some exceptions in the post-war period, in the continued absence of agreement on any final settlement as visualized by Mr. King.

39. Government of Canada, Report of the Royal Commission on the Natural Resources of Alberta (Ottawa, 1935), 38.

Despite the absence of such final settlement, the year 1930 nevertheless marked the time when the Alberta government could begin to demonstrate what Provincial administration could do with the resources, which still constituted "an extensive and valuable public domain."⁴¹

As to comparison between the years of Dominion control and those of Provincial control, caution must be observed. Economic conditions were, of course, different in the years before 1930 in comparison with the years after that date. In addition, the Province obtained lessons and experience from the quarter century of federal administration. Subsequent chapters will consider some of the main policies which the Province of Alberta developed in dealing with its new responsibilities insofar as petroleum and natural gas resources are concerned. In this process, some effects of previous federal policies will be noted.

41. Government of Canada, Report of the Royal Commission on the Natural Resources of Alberta (Ottawa, 1935), 27.

CHAPTER 2

THE DEVELOPMENT OF ALBERTA'S PETROLEUM POTENTIAL

Petroleum and natural gas are found in strata of sedimentary rock which have accumulated in the bottoms of shallow seas. Such seas have periodically invaded the land as a result of sinking and rising of the earth's surface. The accompanying sedimentary rock strata geologically dated from Cambrian to Recent periods have been found to contain petroleum and gas.¹

Hydrocarbons which survive the disintegration of minute marine plants and animals accumulate in the sediments, and under certain conditions of pressure, temperature, and catalysis, are converted into petroleum. Such organic matter is lighter than the salt water with which it is associated, and under the pressure of new upper layers of rock it is forced through permeable sandstone or limestone to a position above the water. Such upward movement is stopped when a reservoir or "trap", made of a layer of impermeable rock roughly shaped like an inverted cup, is encountered. The rising oil and gas

readily enter the reservoir and fill it from the top downward. The oil and gas are confined above the water against the impervious roof of the trap. They cannot escape until the trap is full...This statement is applicable to oil pools in all of their considerable variations in form and size.²

Alberta is part of a large sedimentary area extending down the east side of the Rocky Mountains from Alaska through Western Canada and the United States to the Gulf coast of Mexico and to Guatemala. Other major areas are in the Appalachian region, the Gulf coast States, and California. In Eastern Canada,

-
1. American Geographical Society, World Geography of Petroleum (Princeton, 1950), 3; (Hereafter cited as World Geography of Petroleum).
 2. Ibid., 11-12.

CHAPTER

THE HISTORY OF THE UNITED STATES

The history of the United States is a story of growth and development. It begins with the first settlers who came to the continent in search of a better life. These settlers found a land of vast resources and a people who were eager to learn from them. The United States has since become a nation of great power and influence, and its history is a testament to the strength of its people and the values they hold dear.

The United States has a rich and diverse history, and its people have made many contributions to the world. From the first settlers to the present day, the United States has been a land of opportunity and freedom. Its people have fought for their rights and have built a nation that is a source of pride and inspiration for all.

The history of the United States is a story of growth and development. It begins with the first settlers who came to the continent in search of a better life. These settlers found a land of vast resources and a people who were eager to learn from them. The United States has since become a nation of great power and influence, and its history is a testament to the strength of its people and the values they hold dear.

The United States has a rich and diverse history, and its people have made many contributions to the world. From the first settlers to the present day, the United States has been a land of opportunity and freedom. Its people have fought for their rights and have built a nation that is a source of pride and inspiration for all.

1. American Historical Society, 1215 Broadway, New York, N.Y. 10038.
2. American Historical Society, 1215 Broadway, New York, N.Y. 10038.

Page 11-12

the south of Ontario started with "less than 12,000 barrels in 1862" and New Brunswick "got a little oil in 1859."³ These fields have been maintained in minor output, producing 412,000 and 13,000 barrels respectively in 1954.⁴

The Western Plains sedimentary area in Canada is about 800 miles wide at the United States border, and narrows rapidly to about 200 miles west of Great Bear Lake, then widening to 300 miles at the Arctic coast around the mouth of the Mackenzie river.⁵ It therefore includes a portion of southern Manitoba, the south half of Saskatchewan, nearly all of Alberta, the north-east corner of British Columbia and the narrow strip through the North-West Territories along the valley of the Mackenzie. The average thickness of sediment which might carry petroleum is "of the order of two miles" in this Plains area⁶, which indicates its potential, much of which is still unexplored. In production achieved, Alberta produced 137,000,000 barrels in 1957, and Saskatchewan 37,000,000 barrels, constituting together nearly 96 per cent of Canada's 1957 total of 182,000,000 barrels.⁷ Alberta's 1957 output thus represented about 2.1 per cent of the total world production of crude oil, estimated at 6,429 million barrels.⁸

Such was the output in the Province after more than half a century of development starting with gas discoveries along the advancing C.P.R. line in

3. Max. W. Ball, This Fascinating Oil Business (New York, 1940), 370.

4. Government of Canada, Canada Year Book 1956 (Ottawa, 1956), 541.

5. Funk and Wagnalls, Universal Standard Encyclopedia (New York, 1956), 1337.

6. World Geography of Petroleum, 156.

7. Government of Canada, Canada, 1958 (Ottawa, 1958), 101.

8. Funk and Wagnalls, Universal Standard Encyclopedia (1957 Yearbook) (New York, 1958), 274.

1883. In drilling for water to supply the locomotives, gas was struck at a depth of 1,155 feet, the place being Langevin, later called Alderson.⁹

Drilling in an attempt to find coal was responsible for the first discoveries in the valuable Medicine Hat gas field in 1890. From then until 1904 a number of shallow wells were drilled in this area, none of which had casing cemented. This caused the casing to corrode, permitting gas to filter through to the upper soil and creating a serious fire hazard. Fortunately, the destruction of property was not frequent, and the town grew rapidly with the inducement of gas supplies to attract industry.

Calgary also became interested in gas supplies, and the Calgary Natural Gas Company was organized in 1905, attaining enough gas by 1909 to supply the Calgary Brewery,¹⁰ using a well to the east of the city. The Bow Island field, 174 miles from Calgary, was connected to the city by pipeline in 1912, and was able to serve most of the population with gas for the ensuing eight years.

The next banner year was 1914, when the first discovery occurred in Turner Valley, the field that was to be the most famous in Canada for the next thirty years. The flow of gas from the first well contained "vapor that would condense to almost pure gasoline and it could be used in a motor car without refining."¹¹ Calgary's first oil boom developed, only to be curbed when World War I diverted finances and attention. Edmonton's future supply of gas was also initiated in 1914 with the discovery of the Viking-Kinsella gas field which, however, was not connected to the city for another nine years.

9. Floyd K. Beach, "Alberta's Petroleum Paternity," Canadian Oil and Gas Industries (February, 1956), 37.

10. Ibid., 39.

11. Beach, loc. cit., 42.

Calgary's waning supplies from Bow Island were supplemented when Turner Valley came back strongly in 1924 with new gas and naphtha production on a scale sufficient to start a second and longer stock market boom in Calgary. The naphtha was much in demand, and the gas which had to be produced along with it was so far in excess of market demand that for "more than ten years more than 200,000,000 cubic feet of gas a day, enough to have supplied the city of New York, was thrown away."¹²

Following this second Turner Valley boom, no spectacular developments took place for another twelve years, although many small fields were discovered in scattered locations in addition to the development which continued in Turner Valley itself. During the five years from 1927 to 1931, a total of 590,000 feet of drilling took place in Turner Valley compared with 379,000 feet drilled in all other parts of the Province.¹³ In the next five years, from 1932 to 1936, Turner Valley maintained its predominance, although the economic depression resulted in a reduction of drilling generally. In this period, 223,000 feet were drilled in Turner Valley and 137,000 feet in the remainder of the Province. This included the discovery well of the heavy crude oil field in Lloydminster.¹⁴

In 1936, Turner Valley made Calgary "the world's only city that has

12. Ball, op. cit., 371.

13. Government of Alberta, Report of Natural Gas Commission (Chairman, R. J. Dinning), (Edmonton, 1949), 32. (Hereafter cited as Report of Natural Gas Commission, 1949).

14. Cf., below, 26, for chronological tabulation of the important discoveries of oil and gas in the Province.

based three oil booms on one field."¹⁵ Drilling down to 6,800 feet, over 3,000 feet deeper than the 1924 discovery level, Turner Valley Royalties struck crude oil on the west flank of the Valley and began a new phase of production involving "prolific quantities of oil with only a small gas flow."¹⁶ Because of this new development, Turner Valley's domination of provincial oil production was even more firmly established. In spite of the fact that the Lloydminster field began to show significance in 1939, the period from 1937 to 1941 saw 1,500,000 feet drilled in Turner Valley compared with 386,000 feet in all other parts of the Province.¹⁷

The 1942 - 1946 period can be described as the last period in which declining Turner Valley dominated the Alberta petroleum scene. Expanding activity in other parts of the Province failed to produce enough additional output to compensate for the yearly decline in the Valley, so that total oil production dropped steadily in each of the five years from the 1942 high point. War demands for oil encouraged authorities to approve maximum possible production, so that exhaustion of the field approached sooner than would have been the case if flow had been restricted to amounts ensuring maximum recovery from the reservoirs.¹⁸

Because of the decline in Turner Valley, operators began to regard other areas as having a more attractive future, and drilling activity shifted accordingly. Lloydminster, Wainwright, Kinsella and Medicine Hat fields ex-

15. Ball, op. cit., 373.

16. Government of Alberta, The History of Alberta Oil (Edmonton, 1940), 24.

17. Report of Natural Gas Commission, 1949, 32.

18. Cf., below, Chapter 4 for discussion of conservation.

panded, while many new names were added to the list of fields, including Smith Coulee and Jumping Pound. The shift in drilling is indicated in Table 4.¹⁹

TABLE 4

Alberta Oil and Gas Wells - Footage Drilled in Five Year Periods

1927 - 1946

<u>Period</u>	<u>Turner Valley</u>	<u>Alberta outside Turner Valley</u>
1927-1931.....	590,000	379,000
1932-1936.....	223,000	137,000
1937-1941.....	1,500,000	386,000
1942-1946.....	<u>1,097,000</u>	<u>1,444,000</u>
Totals.....	3,410,000	2,346,000

At the end of 1946, a total of 1,440 wells had been drilled for oil and gas in Alberta, since drilling first began. Of these, 588 were oil wells, 248 were classified as gas wells, and 604 were dry holes.²⁰

In 1947, the discovery of the Leduc field ushered in a new era in the Province's oil history.

Where early discoveries were in the steeply dipping foothills, as in Turner Valley, or in lenticular sands of the Blairmore formation as at Wainwright, Lloydminster and vicinity, the occurrence of large flows of oil in a Devonian reef at Leduc gave an entirely new outlook on the habitat of oil in Alberta.²¹

19. Report of Natural Gas Commission, 1949, 32-33.

20. Government of Alberta, Alberta Oil and Gas Industry, 64 (Calgary, 1955) (compiled by the Petroleum and Natural Gas Conservation Board) (Hereafter cited as Alberta Oil and Gas Industry).

21. Beach, loc. cit. (March, 1956), 55.

Leduc potential was placed at more than 220,000,000 barrels, while the subsequent discoveries of Red water in 1948 and Golden Spike in 1949 added another 850,000,000 barrels to the estimates.^{21.} The footage drilled in 1948 rose to 1,702,000, an amount exceeding that of any five year period in Turner Valley.²²

New discoveries of smaller fields followed in quick succession. For its 1949-50 fiscal year the Alberta government reported 1,973,000 feet drilled, an amount which was exceeded greatly in 1950-51 by a total of 3,359,000 feet.²³ At the same time experimental separation techniques were being initiated in the bituminous sands along the Athabasca river near McMurray in an attempt to find a method of separating oil from the sands at a cost permitting competition with oil from other sources.

In the series of exciting years following the Leduc discovery, 1954 emerged with outstanding significance. Although there was a temporary lull in footage drilled, the fields discovered or established in 1954 set the stage for a new upsurge in development activity. Nine new areas were added to the provincial picture as a result of initial discoveries the previous year.²⁴ These included the Pembina field in the Drayton Valley area which was established as having the greatest potential of all existing fields in Province. By 1956 it was estimated to have an area of 240,000 acres and a

21. Beach, loc. cit. (March, 1956), 55.

22. Report of Natural Gas Commission, 1949, 33.

23. Government of Alberta, Annual Report of Department of Mines and Minerals, (Sessional Papers, Vol. VI, Part 2, 1950-51), 11.

24. Government of Alberta, Annual Review of the Oil and Gas Industry, 1954 (prepared by the Petroleum and Natural Gas Conservation Board), 7, (Hereafter cited as Annual Review of the Oil and Gas Industry).

potential of over a billion barrels.²⁵

The renewed expansion of drilling after 1954 was only partly attributable to the Pembina development. New finds were made in both northern and southern parts of the Province. The first commercial quantities of oil were produced in the Peace River country. Renewed activity north of Calgary, west of Olds and south-west of Turner Valley showed that southerly potential was by no means exhausted.

Accessibility is a factor in future development. By 1956 the government was reporting that "with the exception of the Joffre development, drilling in the more readily accessible light oil fields of the province was completed."²⁶ The motivation to move into less accessible areas such as in Pembina and further north depends in turn on market demand for Alberta oil, which fell off significantly in 1957.

However, there can be little doubt that as the oil-hungry world depletes its more readily available stocks of oil, that new demand for Alberta's potential will arise. Then, if not before, the vast sedimentary area of which Alberta is a part will be the scene of new booms such as those which occurred in Turner Valley in 1914, 1924 and 1936, in Leduc and Redwater in 1947-48, and in the Pembina field in 1954.

The extent of expansion brought on by the Leduc and Pembina discoveries is indicated by the following statistics:²⁷

25. Beach, loc. cit. (March, 1956), 55.

26. Government of Alberta, Annual Report of Department of Mines and Minerals (Sessional Papers, Vol. L, Part 2, 1955-56), 9.

27. Alberta Oil and Gas Industry, 1957.

TABLE 5

ALBERTA

Wells Completed, Oil Wells Capable of Being Operated, and
Total Footage Drilled, 1946 - 1957.

	<u>Total Well Completions-a</u>	<u>Oil Wells Capable-b</u>	<u>Total Footage Drilled</u> (nearest 1,000)
Prior to 1946	1,310	c	6,002,000
1946	130	418	402,000
1947	222	502	882,000
1948	374	717	1,664,000
1949	793	1,242	3,202,000
1950	1,012	1,995	4,332,000
1951	1,238	2,731	5,563,000
1952	1,629	3,661	6,632,000
1953	1,561	4,504	6,423,000
1954	1,178	5,068	5,675,000
1955	1,627	6,138	8,445,000
1956	1,893	7,390	10,094,000
1957	1,448	8,015	7,473,000

c Statistics not Available. a Includes Gas Wells and Dry Holes.

b Includes Gas Wells.

The following table setting forth the times and locations of the major oil and gas developments in Alberta summarizes petroleum discoveries.²⁸

28. Beach, loc. cit. (February and March, 1956;) 55, also Report of Natural Gas Commission, 1949; and Annual Review of the Oil and Gas Industry, 1951-56, and The Oil and Gas Journal, March 17, 1958.

TABLE 1

1954-1955

Table 1 shows the results of the survey of the
 (1) 1954-1955

Year of Survey	1954-1955	1953-1954	1952-1953
1954-1955	1,000	1,000	1,000
1953-1954	1,000	1,000	1,000
1952-1953	1,000	1,000	1,000
1951-1952	1,000	1,000	1,000
1950-1951	1,000	1,000	1,000
1949-1950	1,000	1,000	1,000
1948-1949	1,000	1,000	1,000
1947-1948	1,000	1,000	1,000
1946-1947	1,000	1,000	1,000
1945-1946	1,000	1,000	1,000
1944-1945	1,000	1,000	1,000
1943-1944	1,000	1,000	1,000
1942-1943	1,000	1,000	1,000
1941-1942	1,000	1,000	1,000
1940-1941	1,000	1,000	1,000
1939-1940	1,000	1,000	1,000
1938-1939	1,000	1,000	1,000
1937-1938	1,000	1,000	1,000
1936-1937	1,000	1,000	1,000
1935-1936	1,000	1,000	1,000
1934-1935	1,000	1,000	1,000
1933-1934	1,000	1,000	1,000
1932-1933	1,000	1,000	1,000
1931-1932	1,000	1,000	1,000
1930-1931	1,000	1,000	1,000
1929-1930	1,000	1,000	1,000
1928-1929	1,000	1,000	1,000
1927-1928	1,000	1,000	1,000
1926-1927	1,000	1,000	1,000
1925-1926	1,000	1,000	1,000
1924-1925	1,000	1,000	1,000
1923-1924	1,000	1,000	1,000
1922-1923	1,000	1,000	1,000
1921-1922	1,000	1,000	1,000
1920-1921	1,000	1,000	1,000
1919-1920	1,000	1,000	1,000
1918-1919	1,000	1,000	1,000
1917-1918	1,000	1,000	1,000
1916-1917	1,000	1,000	1,000
1915-1916	1,000	1,000	1,000
1914-1915	1,000	1,000	1,000
1913-1914	1,000	1,000	1,000
1912-1913	1,000	1,000	1,000
1911-1912	1,000	1,000	1,000
1910-1911	1,000	1,000	1,000
1909-1910	1,000	1,000	1,000
1908-1909	1,000	1,000	1,000
1907-1908	1,000	1,000	1,000
1906-1907	1,000	1,000	1,000
1905-1906	1,000	1,000	1,000
1904-1905	1,000	1,000	1,000
1903-1904	1,000	1,000	1,000
1902-1903	1,000	1,000	1,000
1901-1902	1,000	1,000	1,000
1900-1901	1,000	1,000	1,000

1. The results of the survey of the (1) 1954-1955

2. The results of the survey of the (2) 1953-1954

The following table shows the results of the survey of the (3) 1952-1953

3. The results of the survey of the (4) 1951-1952

TABLE 6

A Chronological Summary of the Major Oil and Gas Discoveries and Developments in Alberta from 1884 to 1957.

- 1884 - Alderson - first small flow of gas.
- 1890 - Medicine Hat area - initial gas finds for the field.
- 1894 - Athabasca Landing - first small showings of gas.
- 1897 - Pelican Rapids (Athabasca) - gas well which later caught fire and burned for many years.
- 1902 - Waterton - first flow of oil but too small for commercial production.
- 1904 - Pelican Rapids - three wells indicate oil and gas belt.
- 1908 - Medicine Hat - expansion of gas supply.
- 1909 - Bow Island field - 27 wells were tapped for a pipe line to Calgary, completed in 1912.
- 1914 - Turner Valley - three wells initiate a minor boom. Viking - gas was discovered in this field which was connected to Edmonton by pipeline in 1923.
- 1916 - Foremost - gas was found, indicating the field which later was joined to the Bow Island line.
- 1924 - Turner Valley - Royalite discoveries initiate major expansion. A gas line to Calgary was initiated.
- 1925 - Wainwright - a heavy crude was found whose value was not fully appreciated until after World War II.
- 1927-1929 - Skiff, Dina and Red Coulee - small oil fields begun.
- 1932 - Del Bonita - a small oilfield closest to the southern border.
- 1934 - Lloydminster - initial discovery of heavy crude.
- 1936 - Turner Valley - a new boom involving crude oil on the west flank of the Valley at nearly twice the former depth.
- 1937 - Taber - a small but productive oil field.
- 1939 - Princess and Vermilion - small oil fields.
Lloydminster - discoveries establishing the field.
- 1944 - Conrad - a small but productive oil and gas field.

1933

A chronological survey of the work of the Department and Division
from 1933 to 1937.

1933 - Division - First year of work.

1934 - Division - First year of work.

1935 - Division - First year of work.

1936 - Division (Division) - The work of the Division in 1936
was very good.

1937 - Division - First year of work (the Division).

1938 - Division - First year of work.

1939 - Division - First year of work.

1940 - Division - First year of work (the Division).

1941 - Division - First year of work (the Division).

1942 - Division - First year of work (the Division).

1943 - Division - First year of work (the Division).

1944 - Division - First year of work (the Division).

1945 - Division - First year of work (the Division).

1946 - Division - First year of work (the Division).

1947 - Division - First year of work (the Division).

1948 - Division - First year of work (the Division).

1949 - Division - First year of work (the Division).

1950 - Division - First year of work (the Division).

- 1947 - Leduc - a major discovery opening up a new era.
- 1948 - Redwater - another major field. Leduc - expansion to Woodbend.
- 1949 - Joarcam, Excelsior, Campbell, Bon Accord, Golden Spike, Stettler - a series of important oil and gas fields.
- 1950 - Duhamel, Fenn Big Valley, Drumheller, Spring Coulee - all indications of new expansion areas.
- 1951 - Wizard Lake - an important southern extension of Leduc, also - Bonnyville, Glen Park, Armena, Namao, New Norway, and Peavey.
- 1952 - Bonnie Glen and Westrose - two strong producing areas south of Wizard Lake, also Sturgeon Lake - later to become important. Others - Acheson, North Big Valley, South Camrose, Hamilton Lake, Malmo, Legal.
- 1953 - Pembina - first discovery of the biggest field; Rimbey - thick oil zones and extensive wet gas; also Joffre, Erskine, Fairydell, Samson, St. Albert.
- 1954 - Pembina - major expansion, proving a great potential; Little Smoky - showing advance in Peace River area; also Rocky Mountain House, Wayne, Glenevis.
- 1955 - Sundre-Westward-Ho - important new area with large reserves; also, Clear Hills, Gilby.
- 1956 - Bellshill Lake and Bentley - strong reserves; Harmattan--Elkton - extended three times during the year; also Keystone, South Duhamel, Hespero.
- 1957 - Castle River, Waterton Park, Gladstone - signs of a major gas field in this area. Also, Panther River, Lovett River.

There is every indication that these yearly advances in the Province's petroleum potential will continue if market conditions provide encouragement.

CHAPTER 3

Provincial Administration of Oil and Gas Resources

Alberta's legislative machinery for dealing with the administration of provincial resources was developed to some extent before the transfer of the resources took place in 1930. The limited investment boom of 1914 in Turner Valley was said to have had some influence on the formation of the Board of Public Utility Commissioners in 1915.¹ More legislative interest was stimulated after World War I, during the controversies which developed over the question of returning the natural resources to the Province. In 1925 a Coal Commission appointed by the Alberta government made recommendations for establishment of a Provincial Department of Mines, to be combined with an Advisory Board.² The Commission suggested that until the work of such a department should increase in importance, the portfolio of the Minister of Mines could be combined with that of some other Department.

The immediate chief function of the Department was suggested as being the assembling and publication of information, but expansion of functions was anticipated "if and when the Province of Alberta obtains control of its natural resources..."²

In addition to these activities and suggestions, Alberta had passed an Oil and Gas Wells Act in 1926, which was similar in many ways to the Oil and Gas Wells Act of 1931 which accompanied the transfer of the resources and the creation of the Department of Lands and Mines. Although the 1926 Act conceded Dominion jurisdiction over the resources, it nevertheless stipu-

1. Government of Alberta, The History of Alberta Oil (Edmonton, 1940) 20.
2. Government of Alberta, Report of Alberta Coal Commission (Edmonton, 1925), 323.

lated its intent to "operate as to matters which are within the exclusive legislative jurisdiction of the Province of Alberta."³ The need for such legislation had arisen because of the sudden expansion of the oil and gas industry in 1924. Nearly 500 wells had been drilled in the Province by the end of 1926. Such activity raised the question of defining roads and boundaries, and such matters as prevention of property damage, which were provincial responsibilities.

At the same time the Act went into great detail regarding measures for controlling drilling and production, and for conservation. These matters clearly were under Dominion jurisdiction, and the reasons for their inclusion in the Provincial legislation are not clear. Undoubtedly there was room for conflict of authority under the circumstances prevailing, with the Dominion being responsible for the resources and the Province having its constitutional obligation to deal with property and civil rights.

Under these conditions it would be difficult for either government to organize an efficient system of administration. However, the 1930 transfer of the resources to the Province removed this conflict of authority except insofar as agreements made by the Dominion still prevailed.⁴

The session of the Alberta legislature immediately following the transfer of the resources on October 1, 1930, set up the Province's Department of Lands and Mines. The Recommendation of the Coal Commission in 1925, that the Mines portfolio could be combined with that of some other Department,

3. Government of Alberta, The Oil and Gas Wells Act, 1926, Chapter 6, Section 6.

4. Cf., below, Chapter 5, for more details of the effects of Dominion agreements.

was recognized to some extent by combining the newly acquired lands and mines under one Department. R. G. Reid was named the first Minister of Lands and Mines.

The Act setting up the Department set forth its general powers as follows: ⁵

Subject to the provisions of the Public Service Act, the Department shall have the administration of such Acts relating to lands, mines, minerals, together with any royalties derived therefrom, and any other natural resources vested in or belonging to the Crown in the right of the Province as may from time to time be assigned to the Department by any other Act of this Legislature or by the Lieutenant-Governor in Council, and shall have the administration and management of all lands, mines, minerals and royalties derived therefrom as are administered under any such Act.

The Department was set up under one Deputy Minister, and had a Petroleum and Natural Gas Division. Provision was also made for an Advisory Board of three or more persons appointed by the Lieutenant-Governor in Council and called the "Natural Resources Advisory Board."⁶ Its functions were to act

in an advisory capacity to the Minister for the purpose of furthering the administration and development of any of the natural resources of the Province, and shall undertake such inquiries and investigations as the Minister may from time to time direct.⁶

The Liberal opposition to the U.F.A. government criticized the failure to provide more than one Deputy Minister, arguing that there should be one for lands and one for mines. Premier Brownlee answered that "a director acting under the Minister... could supervise...as well as a Deputy Minister.
..."⁷

5. Government of Alberta, The Department of Lands and Mines Act, 1931, Chapter 46, Section 4.

6. Ibid., Section 9.

7. Edmonton Bulletin, March 4, 1931.

The opposition also criticized the appointment to the Advisory Board of personnel said to be insufficiently acquainted with all aspects of lands and mines, and special stress was laid on alleged deficiency in knowledge of coal problems. They objected to Dr. R. C. Wallace, president of the University of Alberta, being on the Board, on the grounds that he would not have enough time for both jobs. The Premier defended the personnel, paying special tribute to the chairman, Mr. R. J. Dinning "for his fine work in dealing with the coal situation". He also praised Dr. Wallace as being "outstanding in geology,"⁸ and rejected the contention that the two occupations would be excessive.

The new Department and the Advisory Board found the year 1931 to be somewhat confused because of the various problems arising from the transfer of the resources. By February of that year, the "larger portion" of the Dominion's oil and gas supervisory staff had transferred to Provincial service. The oil field operators continued the slowing down of development which had begun just before transfer, as they were apprehensive as to how severe the new regulations might be. The agricultural Committee of the Legislature held hearings on the situation in Turner Valley, and together with the Advisory Board, considered what legislation was needed to control what the Director of the Petroleum and Natural Gas Division called "this colossal and unjustifiable waste."⁹ There was a misunderstanding which held up the transfer of records from Ottawa to Edmonton. Thus "it was only to-

8. Edmonton Bulletin, February 17, 1931.

9. Government of Alberta, Annual Report of Department of Lands and Mines, (Sessional Papers, Vol. XXVI, 1931-32). C.F., below, Chapter 4, for discussion of terms such as "waste".

The opposition to the proposed law is based on the fact that it is not in the interest of the people to have a law which would give the government the right to interfere with the private property of the citizens. The government is not the owner of the property of the citizens and it has no right to interfere with it. The proposed law is a violation of the rights of the citizens and it is not in the interest of the people to have such a law. The government is not the owner of the property of the citizens and it has no right to interfere with it. The proposed law is a violation of the rights of the citizens and it is not in the interest of the people to have such a law.

The proposed law is not in the interest of the people. It is a violation of the rights of the citizens and it is not in the interest of the people to have such a law. The government is not the owner of the property of the citizens and it has no right to interfere with it. The proposed law is a violation of the rights of the citizens and it is not in the interest of the people to have such a law. The government is not the owner of the property of the citizens and it has no right to interfere with it. The proposed law is a violation of the rights of the citizens and it is not in the interest of the people to have such a law.

1. The proposed law is not in the interest of the people.

2. The proposed law is a violation of the rights of the citizens and it is not in the interest of the people to have such a law.

wards the close of the fiscal year, (1931-32) ...that the administration of this Department was set into easier motion."⁹

District offices of the Petroleum and Natural Gas Division were established in Calgary and Lethbridge, with a central office in Edmonton. This was done "so that operations in all parts of the Province could be more efficiently controlled and operators given quicker assistance than had formerly been possible"¹⁰ when the Dominion supervised entirely from Calgary.

The Edmonton office of the Division started with a staff of eight to record all drilling and production in the Province, and, of "greatest importance", to examine all geological samples, recording and correlating them so that results could be made available to operators. Inspections of the oil and gas fields were also initiated, to detect faulty drilling and to ascertain the circumstances leading to abandonment of wells.¹¹

The new Department of Lands and Mines was given authority to deal with the oil and gas situation when the legislature passed the 1931 version of the Oil and Gas wells Act. It applied to all oil and gas wells, regardless of when they may have been drilled. Section 3 of the Act contained 26 subsections listing the powers given to the Department. These included licensing, bonding to ensure compliance with regulations, control of well locations, drilling methods, tools, equipment, structure of wells, records, reports, production, inspection, conservation, and "any other matter reasonably incidental" to drilling or developing wells.¹²

9. Government of Alberta, Annual Report of Department of Lands and Mines, (Sessional Papers, Vol. XXVI, 1931-32). Cf., below, Chapter 4, for discussion of terms such as "waste."

10. Government of Alberta, Annual Report of Department of Lands and Mines, (Sessional Papers, Vol. XXVI, 1931-32), 24.

11. Ibid., 25.

12. Government of Alberta, The Oil and Gas Wells Act, 1931, Section 3. Cf., below, Chapt. 5, for discussion of conservation methods initiated under this Act.

In view of the complex technical knowledge required to administer such controls, and because legal aspects were involved, the legislature in 1932 set up a specialized Board to put the Oil and Gas Wells Act provisions into effect. This was called the Turner Valley Gas Conservation Board, which was to consist of not more than three persons, appointed by the Lieutenant-Governor in Council.¹³

This Board was thus an executive authority rather than a consultative body as was the case with the Advisory Board. Its purpose was to effect conservation and to use "negotiation"... "to bring about unified operation of wells in the area by means of pooling or otherwise."¹⁴ Specifically included in the Board's powers were investigation and testing of wells, closing down of wells, prescription of working pressures, volume of production, and measurement of the value of each well's output. It could levy a penalty of not over \$500 and costs for disobedience of its orders, plus \$100 for each day that the offence continued.

The authority of the Turner Valley Gas Conservation Board was terminated in 1933, and the Petroleum and Natural Gas Division of the Department of Lands and Mines took over the supervision of the wells. Reports do not specify the reasons for this change, but the circumstances indicate possible reasons. Special emphasis was placed on the Board's function as a negotiator, and in this it was unsuccessful. Not only were the Board's recommendations protested publicly by some operators, but litigation was incurred over the regulations for curtailment of flow. At the same time,

13. Government of Alberta, The Turner Valley Gas Conservation Act, 1932, Chapter 6.

14. Ibid., Section 4, subsection 2.

the Department was still perturbed by gas losses and falling pressures in the fields and saw "...ample evidence that further curtailment is imperative..."¹⁵ Under these conditions it was not unreasonable that the Department might wish to try dealing through its Petroleum and Natural Gas Division rather than through the Turner Valley Gas Conservation Board.

This method of administration continued until 1938, when the Petroleum and Natural Gas Conservation Board was set up as part of a new Oil and Gas Conservation Act.¹⁶ This Board was to consist of not over three persons appointed by the Lieutenant-Governor in Council. The members were to have no monetary interest in any phase of oil production. Their general powers were stated to be the keeping of records, the appointment of officials, the making of inquiries, and the controlling and regulating of petroleum production. This Board's powers were more elaborate and more final than those specified for the Turner Valley Gas Conservation Board. In the making of regulations for the industry it could negotiate agreements, or use "other factors" in "uncontrolled discretion."¹⁷

It was these powers and the reaction which they caused among some operators that caused the McGillivray Commission, set up by the government in October, 1938, to question the "dictatorial powers" held by the Board. The Commission held the view that the Board "is given a free hand, subject to the approval of the Lieutenant-Governor in Council, to control and regulate the production of petroleum in such fashion as it may see fit."¹⁸

-
15. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. XXVIII, 1933-34), 41. Cf., below Chapter 5 for more details regarding these conservation problems.
 16. Government of Alberta, Oil and Gas Conservation Act, 1938, Chapt. 15
 17. Ibid., Section 14.
 18. Government of Alberta, Alberta's Oil Industry (The Report of the McGillivray Commission, 1940), 223. Cf., below, Chapt. 5, for details of the Board's regulations and the litigation which developed.

The Commission argued for more detailed declaration of policy by the legislature rather than giving such powers to a "statutory body". They asked for the repeal of the Oil and Gas Wells Act, 1931, and of the Oil and Gas Resources Conservation Act, 1938. Also they recommended discarding of all regulations made under these Acts, and substitution of more acceptable regulations. However, perhaps owing to the war emergency which took the emphasis away from conservation and put it on maximum production, the Acts in question remained in effect until 1950. The two Acts were then consolidated into the Oil and Gas Resources Conservation Act, 1950, with the main incentive for the adjustment being the new situation created by the Leduc and Redwater developments. Even then, the powers of the Conservation Board were not reduced except insofar as the legislation itself laid down more of the regulatory details.

The great expansion following the Leduc and Redwater discoveries also produced changes in the Department of Lands and Mines, itself. Not only was it felt that the volume of administration was now too great for one Department, but the new emphasis on petroleum and natural gas created a sharper difference in the kind of administration as between minerals administration on the one hand and lands on the other.

Accordingly, in 1948, the Department of Lands and Mines Act of 1931 was repealed. The Department of Lands and Forests Act, and the Department of Mines Act set up the two new Departments with those names. In 1949, the Department of Mines was renamed the Department of Mines and Minerals, since the term "Mines" was felt to be inadequate in connection with the production of petroleum and natural gas.

At first the Departments were under one Minister, the Honorable N.E.

Tanner, who had a Deputy Minister for each Department; John Harvie as Deputy Minister of Lands and Forests, and I.N. McKinnon as Deputy Minister of Mines and Minerals. However, when Mr. Tanner retired from the position in 1953, it was felt that a replacement of less experience would find the two Departments to be an excessive load. Therefore, the Honorable Ivan Casey was made Minister of Lands and Forests, while Premier Manning added Mines and Minerals to his own portfolio.

In the Department of Mines and Minerals, the Minister has directly under his jurisdiction the Deputy Minister, the Solicitor and the Statistician. Under the Deputy Minister are the Accounts, Mineral Rights, Mineral Tax, Mines, Technical and Geophysical sections.¹⁹ The Petroleum and Natural Gas Conservation Board is an autonomous body appointed by the Lieutenant-Governor in Council, but responsible to the Minister of Mines and Minerals for administration. This is also true of the Right of Entry Arbitration Boards, which also has three members, and is authorized to settle disputes between owners of surface rights and owners of mineral rights when the latter desire entry on such surface rights for the purpose of exploiting the minerals.²⁰

The administration of Alberta's oil and gas resources has thus achieved a relatively stabilized form after two decades of adjustments in the light of experience and under the pressure of abruptly changing conditions.

19. Government of Alberta, Department of Mines and Minerals, Organization Chart (Edmonton, 1957).

20. Cf. below, Chapter 7, for discussion of land policies, including the role of this Board.

CHAPTER 4

Concepts of Conservation and Proration

In order to appreciate fully what is involved in conservation and proration as the terms are applied in the petroleum and natural gas industry, it is necessary to review briefly the techniques which must be employed in order to obtain the product from its underground reservoirs.

As indicated in the previous chapter, oil and gas are found where underground reservoirs of impermeable rock are created in an inverted bowl configuration as a result of various folds, faults, or contour variations which have occurred in that rock. These reservoirs must be located over porous sedimentary rocks containing petroleum. By means which are still the subject of geological discussion, the petroleum rises through the porous rock until it is stopped by the impermeable rock and is thereby trapped in the reservoir at a higher level than accompanying water.

The first problem, therefore is to locate such reservoirs having petroleum potential. Since they rarely show any surface indication of their existence, it is necessary to obtain an idea of the underground rock contours; the alternative being to drill haphazardly, which has proved to be a costly and generally unrewarding process. When surface indications exist, they may be in the form of significant surface rock contours,¹ or may appear as seepages of escaped oil which can lead to location of the reservoir when soil analysis reveals the concentration areas of petroleum in the soil.

Underground contours may be estimated by analysis of sub-surface rock exposed in mines, water wells, oil wells or experimental drilling. Greater accuracy to greater depths has been obtained by seismograph, which involves

1. Max W. Ball, This Fascinating Oil Business (New York, 1940), 58.

THEORY OF THE CONSTITUTION

The first of the principles which are to be considered in this chapter is the principle of the separation of powers. It is necessary to point out at once that the separation of powers is not a mere theory, but a principle which is to be applied in the construction of the constitution. It is necessary to point out at once that the separation of powers is not a mere theory, but a principle which is to be applied in the construction of the constitution.

The second of the principles which are to be considered in this chapter is the principle of the independence of the judiciary. It is necessary to point out at once that the independence of the judiciary is not a mere theory, but a principle which is to be applied in the construction of the constitution. It is necessary to point out at once that the independence of the judiciary is not a mere theory, but a principle which is to be applied in the construction of the constitution.

The third of the principles which are to be considered in this chapter is the principle of the independence of the executive. It is necessary to point out at once that the independence of the executive is not a mere theory, but a principle which is to be applied in the construction of the constitution. It is necessary to point out at once that the independence of the executive is not a mere theory, but a principle which is to be applied in the construction of the constitution.

The fourth of the principles which are to be considered in this chapter is the principle of the independence of the legislature. It is necessary to point out at once that the independence of the legislature is not a mere theory, but a principle which is to be applied in the construction of the constitution. It is necessary to point out at once that the independence of the legislature is not a mere theory, but a principle which is to be applied in the construction of the constitution.

The fifth of the principles which are to be considered in this chapter is the principle of the independence of the executive. It is necessary to point out at once that the independence of the executive is not a mere theory, but a principle which is to be applied in the construction of the constitution. It is necessary to point out at once that the independence of the executive is not a mere theory, but a principle which is to be applied in the construction of the constitution.

The sixth of the principles which are to be considered in this chapter is the principle of the independence of the legislature. It is necessary to point out at once that the independence of the legislature is not a mere theory, but a principle which is to be applied in the construction of the constitution. It is necessary to point out at once that the independence of the legislature is not a mere theory, but a principle which is to be applied in the construction of the constitution.

The seventh of the principles which are to be considered in this chapter is the principle of the independence of the executive. It is necessary to point out at once that the independence of the executive is not a mere theory, but a principle which is to be applied in the construction of the constitution. It is necessary to point out at once that the independence of the executive is not a mere theory, but a principle which is to be applied in the construction of the constitution.

The eighth of the principles which are to be considered in this chapter is the principle of the independence of the legislature. It is necessary to point out at once that the independence of the legislature is not a mere theory, but a principle which is to be applied in the construction of the constitution. It is necessary to point out at once that the independence of the legislature is not a mere theory, but a principle which is to be applied in the construction of the constitution.

exploding charges at shallow levels, and measuring the speed of shock waves by refraction or reflection,² the rock contours being indicated by the fact that the shock waves have variations in speed at different depths and through different kinds of rocks, and that various rock layers send back individual reflected shock waves to the surface, so that the depth of the layer may be calculated by the time taken for the reflected wave to return.

Also used to map underground layers are the gravimeter, the megnetometer, and the electric current.³ The gravimeter measures minute differences in gravitational pull caused by variation in rock density. The magnetometer measures the variation in magnetic pull which occurs between different types of rock. An electric current can indicate formations by permitting contrast of current flow through the varying resistances of different strata, to a theoretical flow through a homogeneous medium.

Aerial stereoscopic photography has played a part in geological surveys by making possible accurate surface relief maps over large areas. Rock outcrops with underground significance have been detected by this method even in Alberta, which "is covered by glacial drift that masks the character and attitude of the underlying rocks save where streams and rivers have cut through."⁴

Scientific surveys have done much to reduce the percentage of dry holes. But in this connection "the increasiny favorable ratio of productive wells

-
2. E. DeGolyer (ed.), Elements of the Petroleum Industry (New York, 1940), 75-82. This source gives a very thorough technical analysis of the various geophysical methods.
 3. Ball, op. cit., 68-72. This author describes these techniques fully in a manner suited to the layman.
 4. Floyd K. Beach, "Alberta's Petroleum Paternity" Canadian Oil and Gas Industries (January, 1956), 34.

to dry holes" may have been caused partly by "the increasing percentage of all wells which have been put down in proved reserves. That is, there may have been a smaller relative number of true wildcats in recent years."⁵

However, some indication of Alberta's gain through better surveys can be obtained by comparing periods of somewhat similar concentration in proved areas. Drilling prior to 1946 was mostly concentrated in the proved area of Turner Valley,⁶ and resulted in dry holes being 40.9% of well completions. After 1948, drilling became concentrated in Leduc and Pembina areas, but by 1955, dry holes represented only 20.3% of wells completed in the Province.⁷ Many variables are involved, but the marked improvement in the latter period was due in part to the improvement in scientific survey which took place in the Province after World War II. A Survey in the United States dealing only with wildcatting, or exploring in new areas, concluded that

From 1937 to 1942 one out of every six wildcat wells drilled on technical information discovered an oil pool, whereas only one out of eighteen wildcat wells that were drilled without technical advice discovered oil.⁸

The cost of geophysical work is high,⁹ but costs of well drilling vary from \$30,000 in parts of United States¹⁰ to approximately \$100,000 in Alberta. Thus the avoidance of wildcat failures on the scale indicated above would make the survey expenses well worth while.

5. Ronald B. Shuman, The Petroleum Industry (Norman, Oklahoma, 1940), 38.

6. Cf., above, 22 for footage drilled in and outside Turner Valley.

7. Government of Alberta, Alberta Oil and Gas Industry (Calgary, 1955), 64.

8. Guy-Harold Smith (ed.), Conservation of Natural Resources (New York and London, 1950), 373.

9. Lester Charles Uren, Petroleum Production Economics (New York, Toronto, London, 1950), 10. The cost of finding a new barrel of oil was estimated at 50.5 cents in 1946.

10. Ibid., 17.

Concepts of conservation involve not only exploration techniques and the accompanying costs, but also the mechanics and techniques of recovering oil and gas once it has been located.

The oil and gas has to be lifted several thousand feet either by the gas or water pressure in the reservoir or by mechanical means. The latter may include pumping water, air, or gas back into the strata to supplement the natural pressure.

Maintenance of production by the natural pressure is the least costly and simplest method of recovery. And this maintenance of natural oil recovery is related to the rate of flow that is permitted. If unrestricted flow is permitted, more gas per barrel of oil will emerge than if flow is restricted. This may also occur if the rate of flow is too small.

Maintenance of a rate of production in excess of or less than that which yields a minimum gas-oil ratio results in a smaller ultimate recovery of oil than might have been attained had the most efficient rate of production been maintained.¹¹

The above situation develops chiefly when "natural gas is the principal expulsive agent." When advancing water provides the main pressure, excessive production rates may cause "irregular encroachment of edge water" which will cause "reduced ultimate recovery."¹¹

Other causes of reduced recovery include; failure to exclude water which can seal off drainage channels; improper spacing of wells so that some oil areas are not drained, or so that reservoir pressure is reduced uneconomically; and failure to apply the most efficient methods of secondary methods such as repressuring or water flooding.¹²

11. Uren, op. cit., 563.

12. Ibid., 563-565.

Page 10 of 10

...of ...
...the ...
...the ...

The ...
...the ...
...the ...
...the ...

...the ...
...the ...
...the ...
...the ...
...the ...

...the ...
...the ...
...the ...
...the ...

The ...
...the ...
...the ...
...the ...
...the ...

...the ...
...the ...
...the ...
...the ...
...the ...

11. ...
12. ...

From the point of view of the geologist, the petroleum engineer, or the oilfield accountant, the goal of conservation might be to reach the maximum efficiency which technical knowledge would permit in all of these matters pertaining to the mechanics and costs of finding and producing petroleum. There are, however, other considerations in conservation besides reducing losses of the product to the technological minimum. To cover all aspects, the general terms "wisest use" or "the greatest use to the greatest number over the greatest length of time" are used. These are not adequate terms by which to define conservation, since they mean different things to different observers, and furthermore they are to some extent contradictory.

Neither can conservation take into consideration all the factors by which man judges his relations with the environment. Customs, taboos, religions, and other attitudes enter into the value judgements of societies. An example is the loss of resources accepted by the people of India in preference to challenging the sacredness of the cow. A definition of conservation which attempted to include all such factors would hardly reach a satisfactory degree of precision.

Complete avoidance of "waste" is not necessarily essential in conservation. Petroleum and natural gas have remained sealed under the rocks for millions of years, and could remain there for the foreseeable future without significant deterioration or loss. To avoid "waste", in the sense of worthless dissipation of the oil or gas, is therefore possible by leaving these products in their reservoirs. This, however, would seriously reduce the satisfactions of the society deprived of the products. On the other hand, to drill wells without restraint and to operate them at maximum capacity

without regard to future effects is a procedure inviting maximum losses of a limited resource. Good conservation policy will seek a point of maximum utility somewhere between these two extremes.

Conservation may actually involve accepting some losses, if such losses cost more to eliminate than to accept. Such would have been the case if use had been made of the gas flared in the early years of Turner Valley development. The resources required to convey this gas to scattered markets in an undeveloped country would have far exceeded the value of the gas lost. The alternative at the time would have been to leave the naphtha in the ground until industry and population were sufficient to utilize most of the gas which accompanied the naphtha. Such a delay might have had the effect of retarding the growth of industry and population. This is similar to the example given of a community which, by depleting its local ground water reserves, was thereby enabled to develop so that it could afford to acquire distant surface water in abundance. Maintaining the local resource might have permanently stunted the growth of the community.¹³ Similar considerations were involved in the long range development of Alberta and its gas resources.

There is also the question as to whether the Alberta people, during the early stages of the oil and gas development, should have been deprived of the naphtha and gas which they did use, in order to conserve more of the stock for future generations. The answer involves the fact that the value of such resources is related to the supply of alternatives. Water power, synthetic oil and nuclear energy are examples of actual or potential com-

13. S. V. Ciriacy-Wantrup, Resource Conservation, Economics and Policies (Berkeley and Los Angeles, 1952), 57.

petitors to petroleum. They make it necessary to consider the likelihood that future generations will place a reduced value on petroleum. This in turn would justify increased present use at the expense of future supplies.

Such factors, which are difficult to estimate accurately, together with many more tangible considerations, must enter into the calculations of conservation planners, whether they are operating from the standpoint of private or of public interests.

Both private and public planners must consider the effects of use rates in one interval upon use rates in subsequent intervals. Both must discount future values to the present, taking into consideration such factors as markets, interest rates, and other costs of production.

The flow of net revenues extending over time...and the value of physical assets at the end of the planning period must be considered...Thus we may formulate the optimum state of conservation...as that time distribution of use rates that maximizes the present value of the flow of (expected) net revenues.¹⁴

For both private and public planners, the possibilities of reaching this optimum are reduced by errors in appraisal of the environment and of markets and costs. Both will seek to compensate for such uncertainties by seeking flexibility in spreading risks, pooling costs, and generally attempting to "avoid immoderate losses - although of small probability - by accepting the possibility of moderate ones - although the latter are more probable."¹⁵ Here, a loss is considered "immoderate" if it "threatens the continuity of a production plan."

14. Ciriacy-Wantrup, op. cit., 77.

15. Ibid., 88.

The foregoing considerations - the point of maximum utility between no production and unrestrained production; the losses which it would be uneconomical to eliminate; the relation of present practices to future growth; and the possible development of economical alternatives to a resource - are all concerns of both public and private conservation. But the social planners must take into consideration more complex factors which may either re-inforce private objectives, or may in some cases conflict with them.

The social planners must have regard for such extra-market factors as public opinion, the pressure of special groups, and the stability of the society.

Equally from the social standpoint it might be preferable to suffer a petroleum loss which the engineer says is avoidable, than to disregard the principles of equity and fair play on which our social system is founded.¹⁶

Modifying the private concept of revenues and costs by consideration of these added factors would justify the assertion that the objective of the social planner's conservation policy "could formally be defined as that state of conservation which maximizes social net revenues over time."¹⁷

Market values are often used as auxiliary calculations in arriving at this social evaluation, but the effects of monopolistic conditions "restrict the validity of any argument for or against a particular conservation policy if the criteria are existing market values."¹⁸ In other words, market values arrived at through the action of free competition are more likely

16. Government of Alberta, Alberta's Oil Industry (Edmonton, 1940), 215.

17. Ciriacy-Wantrup. op. cit., 230.

18. Ibid., 235.

to reflect the desires of society than are the more arbitrary valuations which may be set under monopolistic conditions.

However, catering to the immediate desires of society may not be synonymous with the maximizing of social net revenues over time. In fact this concept is made up of so many factors and variables that its definition is certain to be elusive. It has been suggested that the social planner cannot allow the objectives of irrational customs to enter into his conservation criteria.¹⁹ On the other hand it has been conceded that he cannot ignore public opinion and the stability of the society, as indicated by the unrestricted production which was permitted in Alberta fields during World War II. It is thus difficult to differentiate between these criteria. Their validity is restricted even as is that of market value calculations. "Maximizing social net revenues over time" cannot be made a precise definition of conservation.

It has also been said that "...a safe minimum standard of conservation is essentially an increase of flexibility in the continuing development of society." This implies that the primary objective is not the maintenance of any particular use rate, but "...to maintain the economic possibility of halting and reversing a decrease of flow or use."²⁰ "Flexibility" is certainly one of the considerations facing the Alberta government in making estimates of natural gas reserves which should be kept in the Province under conditions where competitive fuels have great but unpredictable potential.

19. Cf. above, 41.

20. Ciriacy-Wantrup, op. cit., 253.

be called the "theory of knowledge" and the "theory of values".

which can be the subject-matter of knowledge.

However, according to the scientific method of knowledge we can know

only with the aid of the method of knowledge, but not with the aid of

the method of knowledge, but not with the aid of the method of knowledge.

Let us see how. If we know something about the world, we know

about the world, but not about the world, but not about the world.

Let us see how. If we know something about the world, we know

about the world, but not about the world, but not about the world.

Let us see how. If we know something about the world, we know

about the world, but not about the world, but not about the world.

Let us see how. If we know something about the world, we know

about the world, but not about the world, but not about the world.

of knowledge.

It has been said that "the theory of knowledge is the theory of knowledge".

is essentially an attempt to understand the world, but not the world.

society. This implies that the theory of knowledge is not the theory of

any particular society, but the theory of knowledge is the theory of

knowledge and knowledge is the theory of knowledge. ²⁰ Knowledge is not

knowledge, but knowledge is the theory of knowledge, but not the theory of

knowledge, but knowledge is the theory of knowledge, but not the theory of

knowledge, but knowledge is the theory of knowledge, but not the theory of

19. El. Novy, 19.

20. El. Novy, 19.

In view of the impossibility of defining conservation precisely, it may be as well to accept a simple statement such as "Conservation seeks to insure to society the maximum benefits from the use of our natural resources",²¹ and then allow the deciding authority to assess the current conditions as objectively as possible, and from this to say what "maximum benefits" are and what action will achieve them.

Another concept which we must consider is proration, which has developed as a result of a conflict in outlook between some private and social objectives. The basis of this conflict is the "Rule of Capture", which has been described as follows:

If the whole pool is not under unified control of one operator or group of operators, the individual operator must regard oil and gas as a fugitive resource...This means the resource can be "captured." -- that is reduced to legal possession - by whoever gets there first and works fastest.²²

To avoid the adverse economic effects of "Rule of Capture", conservation policy makers usually attempt to convince operators of the advantages of putting the pool under unified control and of substituting proration for individual maximum production.

Proration can be defined as "the limiting of quantity produced by each operator to some fractional part of his total productive capacity..."²³ The main factor which has made proration acceptable was the general excess of productive potential compared with available market outlets. By allowing each operator to have a prescribed share of the market, based on some formula

21. Smith, op. cit., viii.

22. Ciriacy-Wantrup, op. cit., 75.

23. Shuman, op. cit., 265.

The idea of the possibility of a permanent economic growth, it
may be as well to mention a number of points which are of
importance to society. The economic growth is not a "technical
and then after the technical progress is reached, the growth
objectively is possible, and (according to the theory) it is
and which action will produce them.

Another concept which is very common is that of a "technical
as a result of a condition is reached between some physical and social
level. The basis of this condition is the state of society, which has been
described as follows:

If the whole point is not when technical progress is reached or level
of operations, the technical progress is not a "technical
level reached... This means the economic growth is not a "technical
level reached... It is a result of the economic growth, which is
technical.

The growth of society depends on the state of society, which is
then which action will produce them. The growth of society is
of the state of society, which is reached after the technical progress
individual economic progress.

Progress can be reached in the state of society, which is reached
progress to reach technical growth in the state of society, which is
state of society, which is reached after the technical progress
technical progress is reached after the technical progress, which is
and progress is reached after the technical progress, which is reached
technical progress is reached after the technical progress, which is reached

-
1. Growth, technical progress.
 2. Growth, technical progress.
 3. Growth, technical progress.

probably including well capacity, acreage drained, reservoir pressure, and other factors,²⁴ it is possible to curb destructive competition in marketing and to stabilize prices.

Some consider proration to be primarily a price-regulating device, but it is not likely to be used to maintain prices at illegitimate levels as long as controls are in the hands of agencies responsible to the consuming public.²⁵

Prorationing has become a conservation measure in addition to its function as a market regulator. Regulating the rate of flow can take into account the most efficient use of energy in the whole reservoir, which, as has already been noted,²⁶ results in higher ultimate recovery than would be the case with unrestricted flow. There is some restraint on excessive drilling, thus reducing capital costs and conserving reservoir pressure. Equity is more secure as competing operators obtain a fairer share of the field's total production.²⁷

Proration has now evolved to the point where it clearly rests upon two thoroughly established principles-conservation and equity; and involves three procedures - curtailment of flow, rateable takings, and an adjustment of restricted flow to balance the measured requirements of the market. The plan is administered by means of a quota system by which it is sought to bring into accord the requirements of waste prevention and market demand without violation of the dictates of equity.²⁸

Alberta's McGillivray Commission, investigating the petroleum industry in 1940, concluded that proration without unit operation only mitigated and did not eliminate the evils of the Rule of Capture. Without unit operation

24. Ball, op. cit., 147.

25. Uren, op. cit., 570.

26. Cf., above, 40

27. Cf., below, Chapters 5 and 6 for further discussion of proration in Alberta.

28. Government of Alberta, Alberta's Oil Industry (Edmonton, 1940), 219.

there was always the incentive for operators to drill excessively to prevent others from capturing oil on the boundaries of their territory. This leads to unnecessary capital outlay, and with a limited market reduces the allowables from each well in the field, thus making some less efficient wells uneconomical.

...there will be over-drilling for oil and as a result there will be at all times a wholly unnecessary available supply of oil in a wholly unnecessary number of wells with a consequent wholly unnecessary capital expenditure for offset wells and a wholly unnecessary production cost in relation to each well, to say nothing of the possible danger to wells from over-retarding of flow which may be the case when a great number of wells are prorated to a limited market demand.²⁹

The fact, however, that proration to limited market demand aids conservation to the extent that it conserves reservoir pressure and puts some restraint on drilling, indicates that in the case of a market which can absorb maximum production, the job of conservation under divided ownership will become more difficult. Under these conditions, only equity and engineering considerations indicate the need for restriction and smaller operators are inclined to regard their equity from a short range view, feeling that they should be allowed maximum production in order to overcome their capital costs and to make some immediate return on investment.³⁰

The fact that such motivations prevailed in the first stages of Alberta development led to losses of gas in the search for naphtha, and many statements have been made regarding the "waste" permitted in this period. Upon examination, the term "waste" appears to be more complex than is commonly supposed. Early Alberta legislation did not define the term, a fact that

29. Government of Alberta, Alberta's Oil Industry (Edmonton, 1940), 32.

30. Cf., below, Chapter 5, for Alberta experiences with these problems.

was criticized by the McGillivray Commission in its demands for more specific legislation.³¹ California legislation in 1915 prohibited "unreasonable and willful waste," and defined this waste as blowing, releasing, or allowing gas to escape into the air, or producing gas in quantities exceeding a "reasonable" ratio to the amount of oil produced.³²

The question as to what release of unused gas is "unreasonable" involves the development of technical knowledge, facilities and markets. The more these factors are inadequate, the greater the percentage of escaped gas which might be called reasonable. As indicated in discussing conservation, if technical knowledge is being applied as far as it has been developed, then even if production seems wasteful by later standards, the losses could not have been avoided at the time unless production was prohibited. This remedy could result in much greater waste through impeding of industrial and social development. Similarly with facilities and markets, the inadequacy of which in early stages made flaring of gas unavoidable if naphtha was to be obtained.

In later Alberta legislation the term was defined with more accuracy as follows:

"waste" in addition to its ordinary meaning, means "waste" as that term is understood in the oil and gas industry, and includes the underground or surface loss through wasteful operations of oil or gas or of potentially recoverable oil or gas...³³

The definition is then expanded to include the term "wasteful operations", described as being those which "result or tend to result in reducing

31. Government of Alberta, Alberta's Oil Industry (Edmonton, 1940), 223.

32. California Statutes, Oil and Gas Conservation Act, 1915, Chapter 718 and amendments.

33. Government of Alberta, The Oil and Gas Conservation Act, 1957 Chapter 63, Section 2.

the quantity of oil or gas ultimately recoverable from a pool under sound engineering and economic principles."³³ There is recognition of the fact that from the social point of view, other factors are involved beside engineering and economic principles, including public interest and public safety. For example, one "wasteful operation" is stated to be

the escape or the flaring of gas, if it is estimated that, in the public interest and under sound engineering principles and in the light of economics and the risk factor involved, the gas could be gathered, processed if necessary, and it or the products therefrom marketed, stored for future marketing, or beneficially injected into an underground reservoir.³⁴

However, as noted in discussing conservation, the term "public interest" is subject to such a variety of interpretations that it would be impossible to set down a complete definition of waste by which a planning authority would be left in no doubt as to the correctives required. Such being the case, the definitions above probably go as far as can be expected, leaving the less tangible aspects to be weighed and decided by the planners to the best of their ability.

33. Government of Alberta, The Oil and Gas Conservation Act, 1957, Chapter 63, Section 2.

34. Ibid.

the principle of all of the scientific knowledge that is now being
acquired and economic principles. There is no doubt that the
theories of the social sciences are based on the same
principles and economic principles, including public law and private

law. For example, the principle of operation is based on the

the nature of the function of law, it is a scientific law, it is
public interest and under some conditions principles and in the
light of economic and the social sciences, the law is based on
principles, economic and scientific, and it is the scientific principles
principles, economic and scientific, and it is the scientific principles
principles, economic and scientific, and it is the scientific principles

However, we must in this case, the law is "public interest"

is subject to such a variety of interpretations that it would be impossible

to set down a complete definition of law as a scientific principle.

would be hard to do as the law is a scientific principle. And, being the
case, the definition of law is hard to do as the law is a scientific principle.
the law is a scientific principle and it is the scientific principle of the
law of the land.

CHAPTER 5

Conservation Prior to 1947

In the first decades of development in Alberta's oil and gas fields, it has been estimated that less than one-fifth of the natural gas withdrawn from the wells was utilized by gas consumers. From the beginning of production until March of 1935, 717,110,000 thousands of cubic feet (Mcf) were drawn and 614,050,000 Mcf of this were estimated to have been "wasted".¹ Judging by the definition of waste that had been introduced into 1938 legislation,² the meaning was confined to the engineering aspect of the term, referring to such things as "improper use of reservoir energy" and operation of any well with an "inefficient gas-oil ratio".

The Department of Lands and Mines attributed this loss partly to "wasteful practices" introduced by personnel from United States who were called in to help initiation of development in the Province, and partly to "the inadequacy of the regulations to cover work done on alienated lands,"³ which referred to the legal situation whereby the Dominion was not able to enforce its conservation rules on lands given in subsidy. When the Province received the resources, its legal position was better in regard to these lands since constitutionally the provinces have control over property. At the time of the first Alberta legislation after the transfer, it was thought that the Province "would have the legal right to control all wells..."⁴ Sub-

-
1. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. XXXII, Part I, 1938-39), 70.
 2. Government of Alberta, Oil and Gas Conservation Act, 1938, Chapter 15, Section 2.
 3. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol., XXXII, Part I, 1938-39), 46.
 4. F.K. Beach, "An Engineer Looks at the Law", Canadian Oil and Gas Industries (June, 1954).

sequent litigation confirmed this opinion.

Insofar as the "wasteful practices" introduced from the United States are concerned several factors must be noted. In the nineteenth century, The United States was a world leader in petroleum production, and therefore must have been in the front ranks as far as technical experience was concerned. Also, Canada was short of such technical experience because its oil development began later than did that of the United States. Therefore the advice from the United States was necessary to Canada, and it is doubtful if the quality of the advice could have been improved upon at the time.

In these pioneering years, the emphasis was on production rather than on conservation. This resulted in the establishment of the Rule of Capture,⁵ by which ownership of oil belonged to the one who captured it, even if it came from under a neighbour's land. Competitive drilling led to excess production and premature exhaustion of reservoir pressures. It was only when the seriousness of this situation became evident that more concern developed as to the need for conservation. Even in 1939, referring to existing conservation procedures in Alberta, the McGillivray Commission observed that "Conservation and Proration is in one manner of speaking in its infancy in this Province, and so it is not to be expected that in legislation, regulations, or in Board policy there should have been perfection."⁶

It is true that as far back as 1909, the Canadian government had taken some action on conservation. In that year, a Commission of Conservation

5. Cf., above, Chapter 4.

6. Government of Alberta, Alberta's Oil Industry (Edmonton, 1940), 226.

was set up with twenty members in addition to the Minister of Agriculture,⁷ the Minister of the Interior, and the Minister of Mines. Its powers were broad but general, involving "consideration" of all questions relating to conservation of resources, the collection and dissemination of information, and the framing of recommendations. Regulations required lessees to take "reasonable" measures to prevent loss of natural gas, with the penalty being possible cancellation of lease.⁸

In view of the inexperience of both government and operators in the matter of the petroleum resources, there could hardly have failed to be a lack of clear understanding as to what constituted "reasonable" precautions. Therefore the alternatives were the acceptance of losses which would now be avoidable, or the neglect of petroleum development.

In 1921, the Dominion repealed the 1909 Conservation Act, and replaced it with legislation empowering the Governor-General-in-Council to make such orders and regulations as might be necessary to carry on and complete the work of the Conservation Commission.⁹

The Commission on Conservation was abolished with the view, in part, of saving expenses and, in part, because of alleged interference with, or duplication of the work in other Departments.¹⁰

It is unlikely that such arguments would have prevailed if conservation had been regarded as a matter of relative importance. This minor role was not hard to understand insofar as Alberta's Oil industry was concerned. The

7. Government of Canada, Dominion Statutes, 1909, Chapter 27.

8. Government of Canada, Canada Gazette, Vol. xlvii, 2531.

9. Government of Canada, Dominion Statutes, 1921, Chapter 23.

10. J. Castell Hopkins, Canadian Annual Review, 1921.

was met in this country, and in the course of the discussion of the
the Ministry of the Interior, and the Ministry of Justice. The former were
found that several, including the Government of all provinces, and
concerned in the same, and in the course of the discussion of the
and the Ministry of the Interior, and the Ministry of Justice, and the
Ministry of the Interior, and the Ministry of Justice, and the

2

In view of the importance of the Government and the
order of the political system, there would naturally have to be a
lack of clear understanding as to what constituted the Government,
Therefore the Government was the subject of a series of reports and
avoiding, on the subject of political development.

In 1911, the Government created the 1911 Commission for
it which included members of the Government, and in 1912
order and regulation as to the Government, and in 1913
work of the Government Commission.

The Commission on Government was established with the view, in 1911,
of saving resources and, in 1912, because of alleged irregularities with
the Government of the Government.
It is believed that the Government would have been in a position
and have suggested as a subject for further investigation. This subject was
not had no interest in the Government of the Government, and the

-
7. Government of Canada, 1911, Chapter 27.
 8. Government of Canada, 1911, Chapter 27.
 9. Government of Canada, 1911, Chapter 27.
 10. 1. Government of Canada, 1911, Chapter 27.

brief Turner Valley boom of 1914 had faded out, and it was not until the revival of activity in 1924 that the basis was laid for new interest in conservation of petroleum and natural gas.

Two years after the Alberta Department of Lands and Mines had been established in 1931, it had been able to acquire the records from the Dominion, and had studied the resources situation. It reported the urgency of adopting new methods of conservation in Turner Valley, and offered proof of this urgency by noting the decline in naphtha production in Turner Valley. The Turner Valley Gas Conservation Board presented the following statistics to indicate the situation.¹¹

TABLE 7

Ratio of Dry Gas to Naphtha in Turner Valley, 1925 - 1932.

(Gas-Oil Ration, Mcf per barrel)

<u>Year</u>	<u>Gas(Mcf)[‡]</u>	<u>Naphtha (35 gal. bbls.)</u>	<u>Gas-Oil Ratio</u>
1925	8,760,000	165,717	52.9
1926	8,800,000	211,008	41.8
1927	13,870,000	290,270	47.8
1928	21,320,000	410,623	51.9
1929	61,450,000	908,741	67.6
1930	114,080,000	1,314,039	86.8
1931	169,280,000	1,345,689	126.0
1932	111,080,000	854,116	130.0

[‡] Gas (Mcf) represents gross withdrawals, including flared and marketed gas.

11. Government of Alberta, Department of Lands and Mines (Sessional Papers, Vol. XXVII, 1932-33) Exhibit A, 55.

Under Treasury Vetting from 1941 has been 200, and it was not until the
 arrival of statistics in 1945 that this figure was held for the Treasury. It
 concentration of information and material was.

Two years after the initial development of these and other has been an
 facilities in 1947, to the other side to support the Treasury from the Treasury
 and has revised the statistical material. It contained the survey of which
 for the purpose of concentration in further Vetting, and revised from 1945
 survey in which the Treasury is required to provide information in further Vetting. The
 Treasury Vetting has concentrated from 1945 onwards the following statistics in
 statistics the situation.

TABLE 1

State of the Treasury in 1945-1946

(1945-1946, 1946-1947)

1945	1946	1947	1948
1945	1946	1947	1948
1945	1946	1947	1948
1945	1946	1947	1948
1945	1946	1947	1948
1945	1946	1947	1948
1945	1946	1947	1948
1945	1946	1947	1948
1945	1946	1947	1948
1945	1946	1947	1948

£ 100 (1945) represents 1000 million, including 1000 million and 1000 million
 1000

As an indication of the proportion of gas withdrawn which was marketed, it was estimated that in the period 1927-1933, fifteen percent of the total gas withdrawn in Alberta was marketed.¹²

The rapid increase in the proportion of gas to naphtha after 1926 indicated that the time was rapidly approaching when the reservoir pressure in Turner Valley would be exhausted. This fact impressed the government some time before it received much consideration by the private operators whose solvency depended on maintenance of unrestricted flow. In 1932, Dr. R.C. Wallace, President of the University of Alberta, told the legislature's agricultural committee that "conservation action cannot be taken too quickly," and that he saw "no solution to the problem other than the pooling of the whole field and profits distributed on a pro-rata basis".¹³ Two years later the government noted that the majority of operators were still not aware "that the best naphtha recoveries can only be secured by the maintenance of high back pressures on wells..."¹⁴

Thus, from the beginning of Alberta's control of the petroleum and gas resources, the government faced the situation in which the operators in Turner Valley were

drawing on the common energy of the whole field, an energy without which naphtha recovery will be practically impossible. Entirely apart, therefore from the question of wastage of gas as a commodity of value, the conservation of that energy is a matter of vital importance to the field as a whole.¹⁵

12. Government of Alberta, Report of Natural Gas Commission, 1949, 59.

13. Edmonton Bulletin, March 18, 1932.

14. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. XXIX, 1934-35), 15.

15. Ibid., (Vol. XXVII, 1932-33), Appendix A, 55.

The Department of Lands and Mines estimated that under these conditions, 230 billion cubic feet of natural gas were flared in the period from October 1, 1930 to March 31, 1932,¹⁶ which amount was represented as twelve and a half years of consumption at the rates then prevailing.

One of the factors involved in this flaring was the lack of adequate markets for the gas as compared with the markets for the naphtha. The argument that the loss of gas was justifiable because of the value of naphtha obtained became less valid as the supply of naphtha itself became endangered.

Another use for which this unmarketable gas could have served was the repressuring of the reservoirs by forcing the surplus gas back into the structures. This technique was first instituted in 1937-38, and if government or private research could have speeded up the application of the process, net benefits should have been considerable. Of course, "Secondary recovery methods are usually more expensive than primary operations and have therefore been limited to the most promising areas," but the expense thus involved is so fully justified that the gas and air repressuring" is now (1950) in use in practically all producing states." In central Pennsylvania, production on some leases was increased 700 percent by gas drive, and the United States oil industry has estimated "that possibly as much as 5,000,000,000 additional barrels of oil may be obtained by secondary recovery,"¹⁷ which of course includes water injection.

Excluding the possibility of using surplus gas for such repressuring, the Alberta planners had the choice between immediate acquisition of naphtha

16. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. XXVI, 1931-32), 12.

17. Guy-Harold Smith (ed.), Conservation of Natural Resources (New York and London, 1950, 377.

with accompanying gas losses, or the long range preservation of the gas until markets were available. The latter consideration was in turn affected by the indefinite estimates of what the future reserves of gas would be in relation to the Province's requirements.¹⁸

It is now possible to see with better perspective the losses which were the concern of the Alberta government in these first years of provincial responsibility for the natural resources. The following table compares the gas withdrawn with gas marketed from the beginning of production until the Leduc era began.¹⁹ The figures for the early years are only estimates, since metering of waste gas only began in 1933, and before that there was some unmetered consumption, as well as unrecorded losses due to poorly constructed mains and wells.

TABLE 8

Comparison of Alberta Gas Withdrawn to Gas Marketed up to 1947.

<u>Period</u>	<u>Gas Withdrawn (Mcf)</u>	<u>Gas Marketed (Mcf)</u>
Beginning to 1926	97,000,000	73,000,000 (75%)
Beginning to 1948	1,755,000,000	438,000,000 (25%)
1927-1933 (inclusive)	650,000,000	96,000,000 (15%)
1933-1940 "	565,000,000	107,000,000 (19%)
1941-1947 "	446,000,000	214,000,000 (48%)

The effects of markets on conservation is indicated by the fact that in the 1927-33 period, depression conditions in the latter part of the period

18. Cf., below, Chapter 8.

19. Government of Alberta, Report of Natural Gas Commission, 1949, 59.

bore some responsibility for gas marketed dropping to 15 percent of the total production, whereas the high demand developed in the 1941-47 period, mainly because of urban conversion to gas from coal, raised the proportion sold to 48 percent. Other factors involved in this improvement were development of population and industry, and advancement of techniques for repressuring and underground storage of gas.

Had the officials in the first years of the Department of Lands and Mines been able to forecast future development accurately, they would have found that the 578,000,000 Mcf²⁰ estimated to have been lost from the beginning of production to the end of 1933 represented just 7.6 percent of the 7.61 trillion cubic feet estimated consumption for the Province from 1958 to 1988, or 2.75 percent of the 21 trillion cubic feet estimated to be Alberta's reserves in January, 1958.²¹ Thus losses that seemed immense at first appeared much less significant when compared with the resources which the early activity helped to open up.

However, it is quite understandable that the Alberta government taking over control of the resources in 1931 would take a more serious view of the situation than might seem justifiable today. In March 1932 the agricultural committee of the legislature heard Dr. J. A. Allan, professor of geology at the University of Alberta, given an estimate of the seriousness of the situation in what was then the Province's main oil and gas producing area. He warned that "under existing conditions, the life of the Turner Valley gas field would have a maximum of four years and probably not more than two years."²²

20. Cf., above, Table 8

21. Edmonton Journal, February 5, 1958. (Report on the 1958 Borden Royal Commission on Energy.)

22. Edmonton Bulletin, March 16, 1932.

If no new factors had entered the situation, an extrapolation of the rising gas-oil ratio indicated in Table 7²³ would have been a valid estimate and would probably have justified Dr. Allan's conclusion. However, the field's life was prolonged much further than his estimate, partly because the government did take corrective measures, and because new sources of oil and gas were found in the field at lower depths.

In considering the measures which should be taken in view of the situation as it appeared at that time, Premier Brownlee pointed out that there were two courses open to the government. One was arbitrary legislation, which he suggested might involve delay through excessive litigation, taking into consideration the fact that a small group of independent companies were opposing "any scheme restricting present output."²⁴ The other was voluntary agreement among the operators and the government regarding conservation methods.²⁵

To obtain voluntary agreement among the operators was by no means a simple matter. Some independent companies had, for example, drilled some gas and naphtha producers in the southern part of Turner Valley in 1929 and 1930. They tried to get their gas processed by the absorption plant owned by the Royalite Company, the purpose being to obtain natural gasoline from the gas. Unable to deal with Royalite, the independents were organized into Gas & Oil Products, Ltd., which erected a new absorption plant at the cost of nearly half a million dollars on the assumption that "they would be allowed to develop the property and operate the wells without restriction

23. Cf., above, 54.

24. Edmonton Bulletin, March 12, 1932.

25. IBid.,

(save as provided in the leases)...."²⁶

Such an organization, having made its plans on the basis of operation "without restriction", and seeing its competitive position against the larger companies jeopardized if conservation measures reduced output, naturally regarded voluntary agreements with some hostility.

For Brownlee's second alternative, that of "arbitrary legislation," there was considerable scope for regulations under the Oil and Gas Wells Act of 1931,²⁷ and the Turner Valley Gas Conservation Act of 1932. The latter Act proposed establishment of conservation measures in Turner Valley by negotiating "to bring about unified operation of wells in the area by means of pooling or otherwise."²⁸ It also authorized the appointment of a Board with full powers to take conservation measures, including the immediate reduction of gas output in the Turner Valley area to an aggregate amount of not more than 200 million cubic feet of gas per day, and prescribing the daily rate of production for every well.

It soon became necessary to apply the "arbitrary legislation" which Premier Brownlee had designated as being the least desirable alternative. On April 2, 1932, the Premier announced that voluntary negotiations to achieve conservation had failed.²⁹ As he had indicated earlier, many consumers wanted conservation, but without any increase in the gas rates, and some independent companies were opposing any restricted output.

26. Government of Alberta, Alberta's Oil Industry, 227.

27. Cf., above, 32.

28. Government of Alberta, The Turner Valley Gas Conservation Act, 1932, Chapter 6, Section 4.

29. Edmonton Bulletin, April 2, 1932.

(and as provided in the Annex)....

...in the event of a dispute, the Commission shall be competent to settle the dispute. The Commission shall also be competent to settle the dispute in the event of a dispute between the Commission and the Member States.

The Commission shall be competent to settle the dispute in the event of a dispute between the Commission and the Member States. The Commission shall also be competent to settle the dispute in the event of a dispute between the Commission and the Member States.

The Commission shall be competent to settle the dispute in the event of a dispute between the Commission and the Member States. The Commission shall also be competent to settle the dispute in the event of a dispute between the Commission and the Member States. The Commission shall also be competent to settle the dispute in the event of a dispute between the Commission and the Member States.

The Commission shall be competent to settle the dispute in the event of a dispute between the Commission and the Member States. The Commission shall also be competent to settle the dispute in the event of a dispute between the Commission and the Member States. The Commission shall also be competent to settle the dispute in the event of a dispute between the Commission and the Member States.

-
20. The Commission shall be competent to settle the dispute in the event of a dispute between the Commission and the Member States.
 21. The Commission shall be competent to settle the dispute in the event of a dispute between the Commission and the Member States.
 22. The Commission shall be competent to settle the dispute in the event of a dispute between the Commission and the Member States.
 23. The Commission shall be competent to settle the dispute in the event of a dispute between the Commission and the Member States.

On May 4, 1932, acting under the authority of the Turner Valley Gas Conservation Act, the Conservation Board issued Order Number One, limiting daily gas production in the field to 200 million cubic feet, and restricting wells to a prorated allowance. The Board also utilized a staff of six engineers to continue and complete the tests begun earlier by the Petroleum and Natural Gas Division of the Department of Lands and Mines. These tests, giving scientific evaluation of the condition of the field and the savings to be made through conservation techniques, were not only valuable in guiding the Board as to what future directives should be made under the Act, but also were of importance in educating the operators. For those whose annual costs could be met out of restricted production, a case could readily be developed showing increased return on investment over the years as a result of greater recovery per well.

Nevertheless, the restrictions brought forth litigation as the Premier had anticipated. Spooner Oils Ltd., and Richfield Oil Co. Ltd., both contested the Board's injunctions. The companies lost both the preliminary cases and the appeals, except that the Board was not upheld in its attempt to deduct its expenses from the operators' income.

By the following year, some improvement was noted in the operation of the field and in the attitude of the operators.

Considerable expense has been incurred by the Government to obtain all the data possible relating to Turner Valley conditions. The expense, however, was unavoidable, as the information could not have been collected in any other manner. It is satisfactory to note that justification for these efforts is now apparent by a slight improvement in operation. This would indicate that operators have realized that they would be the principal sufferers by a continuance of the wasteful methods....³⁰

30. Government of Alberta, Annual Report of the Department of Lands and Mines, (Sessional Papers, Vol. XXVII, 1932-33), 45.

However, while the operations may have shown improvement, the accumulated effect of poorer procedures in the past, together with the Board's restrictions on production, resulted in a considerable drop in oil output from Turner Valley, which is reflected in the decrease of 375,000 barrels for the whole Province in 1932-33 as compared with 1931-32.³¹

The deterioration of the field was regarded as being the main cause of the reduced output.

The major portion of the decline...must be classed as due to the increasing dryness of the gas obtained from the older operated wells, and fully confirms the necessity for operators being compelled to discover methods of production which will reduce the waste and thereby prolong the naphtha producing life of these at present uneconomically operated wells...^{31A}

The Board's testing program had arrived at an estimate of the gas reserves in the Turner Valley field, disregarding the danger to the field from water encroachment, which they did not regard as being too serious. Assuming a pressure maintained at 400 pounds, the life of the field was estimated at seven years. The testing also analysed waste gas, concluding that much naphtha was not being recovered, but was being burnt along with the flared gas.

The testing was by no means complete. Accurate data were still required regarding the capacity and potential production of individual wells already drilled and of the reserves in undrilled acreages. The conservation measures adopted would unavoidably work more of a hardship on partially exhausted wells than on new ones. But continued testing would improve the ac-

31. Government of Alberta, Annual Report of Department of Lands and Mines, (Sessional Papers, vol., XXVII, 1932-33,) 48.

31A Ibid.

curacy and fairness of the control regulations to be developed.

The Board was still investigating the acceptability of voluntary pooling schemes, but was not encouraged.

The Board believes that conservation at the present time can be more readily effected through putting into effect a plan of proration of gas to be allowed to be produced in the whole field.³²

In accordance with this, Premier Brownlee introduced a resolution to the legislature restricting the gas flow in Turner Valley "as nearly as possible to 40% of the total open flow of each well...."³³

This percentage was estimated to produce a daily flow of 230,000,000 cu. ft., and it was hoped to maintain a maximum daily flow of not over 240,000,000 cu. ft. This represented a slight increase in the maximum suggested in 1932.³⁴

The following year, 1933-34, brought extended development of the Turner Valley field, and slight improvements were noted in efficiency of production. This was mainly due to the success of the Royalite absorption plant. But the government still noted much flaring by independents and argued that "the logical procedure would be to revert to the 25 percent allowable withdrawal as originally set out in the provincial regulations."³⁵ Since the independents took the opposite view, collective agreement was not forthcoming.

In February of 1933, the authority of the Turner Valley Gas Conservation Board was terminated and its duties were taken over by the Petroleum and Natural Gas Division of the Department of Lands and Mines. The change was deemed necessary because the Board had not been successful in securing the

32. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. XXVII, 1932-33), 63.

33. Edmonton Bulletin, April 5, 1933.

34. Cf., above, 61.

35. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. XXVIII, 1933-34), 41.

1200-27-0

necessary co-operation from the operators, and because consistent policies of conservation were required in all the Province's oil producing areas while the Board had been specifically assigned to Turner Valley.

Production was up in 1933-34 in spite of falling Turner Valley pressure. The increase was due to drilling of new wells, a process which continued in the following year. During this period, the pressure fall in Turner Valley averaged .35 pounds per square inch per day.³⁶

In the Bow Island gas field, gas for the first time, was successfully injected into depleted sands. More gas was handled by owners of absorption plants who were buying out independent producers. Thus less gas was being totally lost.

In the year 1935-36, the repressuring of the Bow Island field had been continued until the pressure at the end of the fiscal year was up to 504 pounds.³⁷ Also, the first large unitization scheme was completed on the west flank of Turner Valley.

The new government discontinued the quotas which had been in effect on gas withdrawals. "No penalties had ever been imposed for violation of quota, and as a result those who faithfully observed the quotas were put to a disadvantage by others who paid no attention to them."³⁸

The attitude of the operators toward voluntary conservation measures was improving.

The opposition of many operators to any change in their methods nulli-

36. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. XXIX, 1934-35,), 15.

37. Ibid., Vol. XXX, Part I, 1935-36, 18.

38. Ibid., 43.

possibility of obtaining from the Government, and various countries, the
of cooperation were required in all the Government's and Government
which the Government has been consistently engaged in since 1914.

Protection has been given to the Government's interest in the
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.

In the Government's interest, the Government has been consistently
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.

In the Government's interest, the Government has been consistently
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.

The Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.

The Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.

The Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.

The Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.
Government has been consistently engaged in since 1914.

fied the work of the Board; (Turner Valley Gas Conservation Board, 1932-33) however, with the completion of the Turner Valley Royalite crude oil discovery well in June 1936, the majority of the operators.. became conscious of the fact that speedy action was essential...³⁹

With drilling activity still mainly concentrated in Turner Valley, the production of oil and natural gas began a slow increase after reaching a low point in the year 1932-33. This trend could not be attributed entirely to new drilling, but must be credited to some extent to the improved techniques of repressuring and to improved facilities.

Nevertheless, the new zone discovered in 1936 in Turner Valley, yielding a predominance of oil over gas, turned out to be another important milestone in the field's history. By 1937, production was exceeding the capacity of pipelines to Calgary, and markets for refined gasoline were inadequate for the supply available. Purchasers began to prorate their purchases using the previous month's figures as a basis, but even this procedure became ineffective to deal with the very rapid expansion of production. The new volume came as a result of the new wells and of the rate at which they were allowed to flow.

It became evident from rising gas-oil ratios that some wells were being produced at rates which would soon ruin them and which would result in terribly small ultimate recoveries as compared with what might be expected if production was restricted and carried out on the basis of orderly development.⁴⁰

Prompted by these conditions, the Alberta government, in 1938, passed a comprehensive Oil and Gas Conservation Act, creating a Petroleum and Natural Gas Conservation Board with "uncontrolled discretion" and power to

39. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. XXXII, Part I, 1937-38,) 9.

40. Government of Alberta, The History of Alberta Oil (Edmonton, 1940), 24.

use any method to prevent exhaustion of fields.⁴¹

However, after discussing the problems with the United States Department of Mines, the Alberta government obtained some different concepts of conservation requirements, which resulted in a special session of the legislature being called in November, 1938. Here the Act of a few months earlier was repealed and re-enacted under the name of the Oil and Gas Resources Conservation Act.⁴²

The November Act was more comprehensive and detailed than its predecessor. Once again it set up a Petroleum and Natural Gas Conservation Board of not more than three persons, appointed by the Lieutenant-Governor-in-Council. Its general powers were to keep records, appoint officers, obtain services, make inquiries, control and regulate petroleum production. It was authorized to enforce regulations under the Oil and Gas Wells Act of 1931. It had power to inspect wells and refineries, to prohibit production, and to enforce its regulations by seizure.

The Board did not content itself with occasional observations, but kept a continuous service, issuing new proration orders from time to time as conditions changed. Thus, if the allowable for any well had been set higher than it should have been, falling bottom hole pressure and rising gas/oil ratios would cut its next allowable and vice-versa.⁴³

Some operators accepted and welcomed the Board's prorationing, calculating that long run returns would be greatly enhanced by the control. But for reasons already indicated, many independent operators strongly protested the prorating recommendations.⁴⁴

-
41. Government of Alberta, Oil and Gas Conservation Act, 1938 (First Session), Chapter 15.
 42. Government of Alberta, Oil and Gas Resources Conservation Act, 1938 (Second Session), Chapter 1.
 43. Government of Alberta, The History of Alberta Oil (Edmonton, 1940), 24.
 44. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. XXXII, Part I, 1938-39), 12.

and was subject to forward transmission of 100%.

However, after discussing the Commission with the United States Agency-

most of them, the Commission considered some different proposals of

investigation possibilities, which resulted in a special session of the Joint-

before being called in November, 1952. There the role of a few months earlier-

was revealed and re-evaluated under the terms of the GDI and the Commission has

investigation act.

The Commission has now more responsibilities and detailed than the other-

others. This is due to a revision and liberalization of the Commission Board

of the Joint Board, established by the Commission-Commission-

Committee. The General Commission now is more flexible, especially in the

services, more flexible, looking and regarding the Commission's activities. It was

authorized to conduct investigations under the GDI and the Commission has to

It has been in contact with the Commission, for technical assistance, and

to conduct its investigations in the future.

The Board has not changed itself with technical assistance, but has
a technical service, which has been established from time to time as
a technical service. This is the Commission for the Joint Board has
which has been established, looking and regarding the Commission's activities. It was
authorized to conduct investigations under the GDI and the Commission has to

Some technical assistance and technical assistance has been established, which-

which has been established from time to time as a technical service, which

for technical assistance, which has been established from time to time as a

the following recommendations:

1. Government of the United States, the Commission, the Joint Board

2. Government of the United States, the Commission, the Joint Board

3. Government of the United States, the Commission, the Joint Board

4. Government of the United States, the Commission, the Joint Board

5. Government of the United States, the Commission, the Joint Board

At this time the Alberta government's views on the conservation situation were summarized in a section of the brief presented by the government to the 1938 conference on Dominion-Provincial relations.

Gas wastage in the Turner Valley has seriously depleted the gas reserves in Alberta, and this can be attributed solely to the restrictions imposed upon the province at the time of the transfer of the natural resources to Provincial control, which has prevented the Alberta government inaugurating any scheme of conservation.⁴⁵

Thus, besides stating that adequate conservation had not been possible since 1930, the Alberta government was also implying that there had been a lack of conservation under Dominion auspices, and that the Dominion's policies were continuing to put "restrictions" on the Province. This in turn was related to the fact that the Province was still legally bound to some extent by the commitments that the Dominion had made before the transfer of the resources.

The Natural Resources Transfer Agreement and amendments gave an indication of the extent to which the Province had been restricted, and of how more freedom of action was attained.

And whereas by paragraph 2, October 1, 1930 of the said Natural Resources Transfer Agreement, the Province agreed that it would carry out, in accordance with the terms thereof, every contract to purchase, or lease any Crown lands, mines, or minerals and every other arrangement whereby any person had become entitled to any interest therein as against the Crown, and further agreed not to affect or alter any term of such contract to purchase, lease or other arrangement by legislation or otherwise, except either with the consent of all parties thereto other than Canada, or in so far as any legislation may apply generally to all similar agreements relating to lands, mines or minerals in the Province or to interests therein, irrespective of who might be parties thereto.⁴⁶

Since the Province was thus not restricted with regard to legislation

45. Government of Alberta, The Case for Alberta, Part I (Edmonton, 1938), 225.

46. Great Britain, Imperial Statutes, 1930, Chapter 26.

applying "generally to all similar agreements," it is difficult to follow the argument that the Alberta Government was thus prevented from "inaugurating any scheme of conservation." The difficulty increases in view of the fact that in its first years of administration the Province was not successfully challenged in its legislation on strong conservation measures, nor in its implementation of repressuring and curtailment of flow.

At any rate, in later additions to the Natural Resources Transfer Agreement,⁴⁷ such restrictions as did exist over provincial freedom of action were removed.

Actually, it is probably more valid to say that the lack of satisfactory conservation measures to which the Alberta brief to the 1938 conference referred was predominantly due to inadequate assessment of accumulated conservation experience and its application to the Alberta situation. The government itself indicated the validity of this viewpoint by its appointment in 1939, of a Royal Commission under the chairmanship of the Honourable Mr. Justice A. A. McGillivray, with instructions to undertake an exhaustive examination of Alberta's oil industry. The Commission worked for two years and turned in an extensive report.

Regarding the conservation measures already taken, the Commission expressed the following opinion:

Certainly the conservation and proration schemes which have been brought to our notice cannot be said to have defeated the workings of the "Rule of Capture."⁴⁸ Without doubt much has been done to mitigate the evils of that rule but it still stands with many economic ills resulting from it. It is true that under a rule of proration to market, the

47. Cf., below, Chapter 6.

48. Cf., above, Chapter 4.

applying generally to all similar agreements, it is difficult to see how the agreement could have been presented from the point of view of the kind and scope of domestication. The difficulty increases in view of the fact that in the first years of implementation the provision was not always fully complied with in relation to many countries, and in the implementation of provisions not mentioned in the law.

It may be, in other words, that the provision in the law is not always complied with, and that the provision is not always complied with in relation to many countries, and that the provision is not always complied with in relation to many countries.

Actually, it is possible to say that the law is not always complied with, and that the provision is not always complied with in relation to many countries, and that the provision is not always complied with in relation to many countries.

Governmental bodies have been established in the various countries, and the provision is not always complied with in relation to many countries, and that the provision is not always complied with in relation to many countries.

Regarding the countries mentioned above, the provision is not always complied with in relation to many countries, and that the provision is not always complied with in relation to many countries.

Regarding the countries mentioned above, the provision is not always complied with in relation to many countries, and that the provision is not always complied with in relation to many countries.

Regarding the countries mentioned above, the provision is not always complied with in relation to many countries, and that the provision is not always complied with in relation to many countries.

bringing of the oil to the surface of the ground may be retarded, but since the right to drill is in no wise altered, the opportunity of taking oil from underneath one's neighbour's land is still open, even though the speed with which it is taken away be diminished. In short, the evils of the "Rule of Capture" still exist, minimized though they be, and it may be added that, under proration, they do harm in new ways....⁴⁹

The possible new ways of harm are then indicated as being the continued possibility of drilling to take oil from neighbouring concessions, the possibility that maximum quotas under proration may not be sufficient to meet overhead costs, and the likelihood that the allowables may be reduced further as more wells are drilled. Also mentioned as harmful are the incentives for individual companies to drill more than they normally would in order to prevent encroachment by others, and in order to qualify for quotas to meet refinery requirements. The latter motive would arise because wells which formerly would have been adequate would no longer be so under the reduced prorated output.

As a result of these factors, the Commission remarked that "If it were possible to have an undivided pool under a single management, we would then have the ideal both from an economic and conservation viewpoint."⁵⁰

Stress was placed on the fact that over-production, leading to an excess of supply over current demand, and also to decreased efficiency of wells, was undermining the economic structure of the industry. These factors are seen as being "outstanding characteristics of the industry in times past" which have brought about "waste and economic chaos." It is therefore concluded:

49. Government of Alberta, Alberta's Oil Industry, (Edmonton, 1940), 30.

50. Ibid., 26.

..that free competition and the so-called law of supply and demand would not have served, without government intervention to prevent shameful waste of a natural resource and to keep the industry itself from complete demoralization.⁵¹

One of the causes of over-production was said to be the drilling requirements set forth in the leases. Royalties were dependent upon these drilling requirements being met. The effect of government policy seemed to be the encouragement of drilling without sufficient regard for market requirements and the consequent effect on prices and costs.

Another cause of over-production indicated was, of course, the "Rule of Capture," by which oil ownership is only recognized when possession is obtained, thus encouraging attempts to drain oil from areas where the surface is leased to others.

The Commission saw government conservation and proration as being only a partial solution in fields of divided ownership. Most desirable was the operation of the pool as an undivided unit, together with government co-ordination between the different pools "with a view not only to the stabilization of the economic structure of the industry, but also to the creation of reserves which are held as such."⁵²

However, the Commission regarded Turner Valley as being a situation where it was impractical to enforce unit operation, due to the diversity of surface ownership. Since each field, each section and each well have different characteristics, the value of the pool allocable to any surface section is difficult to agree on, even with only two or three operators in a field. With a larger number of producers, "the difficulties of a voluntary

51. Government of Alberta, Alberta's Oil Industry (Edmonton, 1940), 41.

52. Ibid., 42.

agreement for unit operation become almost insurmountable."⁵³

Therefore the Commission felt that in Turner Valley the government should attempt to foster breadth of vision among the operators to make proration effective.

In the case of new pools being discovered, unit operation was recommended. In such cases, leasing of the pools could be done in such a manner that efficient withdrawal would not conflict with the interests of individual proprietors to the extent that it did in existing production situations.

It was felt that where investment had already taken place, some inefficiency was preferable to excessive interference with the rights of the proprietors. Thus the Commission was giving recognition to the social factors which should be included in a maximum conservation formula.⁵⁴

The early hostility of the operators toward the restrictions of the Conservation Board prompted the Commission to recommend that the conservation and proration authorities should not be given unlimited powers. It was recommended that the Legislature should define waste and other factors involved in the general policy. Furthermore, the powers of the Board should be stated specifically, as should the steps required to institute appeals.

With these recommendations in mind, the Commission felt that the Oil and Gas Wells Act, 1931, Chapter 46, and the Oil and Gas Resources Conservation Act, 1938, Second Session, Chapter 1, were unsatisfactory in that both Acts gave "dictatorial powers."⁵⁵ In the former Act, these powers are given

53. Government of Alberta, Alberta's Oil Industry (Edmonton, 1940), 35.

54. Cf., above, Chapter 4.

55. Government of Alberta, Alberta's Oil Industry (Edmonton, 1940), 221.

to the Lieutenant-Governor-in-Council, while the 1938 Act puts the authority in the hands of the Petroleum and Natural Gas Conservation Board.

The opinions of the operators are suggested by the following quotation from the brief to the Commission submitted by Gas and Oil Products Limited:

...the conduct of the Conservation Board has not been that of a quasi-judicial body, but rather that its conduct has been arbitrary, unreasonable, and in complete disregard of the principles of equity, and contrary to good engineering opinion.⁵⁶

The charge of disregarding the principles of equity was based on the argument that many wells could not operate on the low output set by the Board, and that wells thus closed down would enable other concerns to draw off more than their share of the gas if the gas had free movement underground. The company, however, was more inclined to argue that the gas did not have free movement underground, and that therefore there was not sufficient justification for treating the field as a single pool, and hence no need to cut production to such an extent in the company's wells.

The Conservation Board did not answer these statements before the Commission, so it is difficult to obtain a balanced assessment of the particular cases involved. However, there has never been an unprejudiced argument that denied the need for restriction of maximum flow in order to obtain maximum recovery over time. Such restrictions cannot avoid adverse effects on marginal producers. It would be extremely unlikely that any responsible governing body could jeopardize the social equity in order to maintain that of such producers.

The Commission, however, seemed to feel that regardless of the validity

56. Government of Alberta, Alberta's Oil Industry (Edmonton, 1940), 226.

of the Board's rulings, there should be closer consultation with the industry in the drafting of the regulations and better opportunity for appeal.

Accordingly it recommended that the Oil and Gas Wells Act of 1931 and the Oil and Gas Resources Conservation Act of 1938 be repealed and the regulations issued under them be discarded. It was felt that a new Act should be drafted by special counsel familiar with the petroleum industry, and that regulations should be handled by a three-member Board representing the consumers, the industry, and also taking into account engineering, accounting and legal opinion.

In spite of these recommendations, only minor changes were made in 1941 to the Oil and Gas Resources Conservation Act. The most important amendments dealt with re-adjustment of the taxes which could be levied by the Petroleum and Natural Gas Conservation Board on mineral properties, to meet the expenses of the Board.⁵⁷

However some Commission viewpoints were incorporated in The Unit Operation of Mineral Resources Act, 1941, which authorized the Minister of Lands and Mines to enter into agreements with owners of minerals for development of such minerals together with those owned by the Province. A unit plan was provided for, with both the private owners and the Province joining in the expense of the development and in the accruing benefits.⁵⁸

In the same year, the Provincial government moved to increase further its independence of the Dominion by ratifying an amendment to Section 2 of the Natural Resources Transfer Agreement of 1930. The amendment permitted

57. Government of Alberta, The Oil and Gas Resources Conservation Act Amendment Act, 1941, Chapter 76.

58. Government of Alberta, The Unit Operation of Mineral Resources Act, 1941, Chapter 69.

the Province to exercise a larger measure of control over petroleum and natural gas leases in the interest of orderly development and conservation.⁵⁹

This was followed in 1942 by a new and comprehensive Act designed to consolidate and expand the provisions of the Oil and Gas Wells Act of 1931. Far from dissolving the "dictatorial powers" described by the McGillivray Commission, this Act confirmed and ratified all acts of the Petroleum and Natural Gas Conservation Board under the 1931 Act.⁶⁰

Further agreement with the Dominion was also reached in 1942 and duly ratified by the Legislature. The purpose of this agreement was stated to be the extension of the jurisdiction of the Legislature over contracts to purchase and lease petroleum and natural gas, subject to certain conditions and restrictions as to the royalty to be collected. The extension of the provincial jurisdiction was indicated in the following addition to paragraph 2 of the 1930 Natural Resources Transfer Agreement in which the Province agreed to carry out the terms of agreements made prior to 1930, and not to alter them except with the consent of all concerned:

Provided, however, that the provisions of this paragraph shall not apply to any contract to purchase or lease petroleum or natural gas or to any other arrangement whereby any person prior to the first day of October one thousand nine hundred and thirty, had become entitled to any interest in such petroleum or natural gas as against the Crown.⁶¹

Thus the right of the provincial government to regulate the petroleum industry emerged unchallenged. But by the 1944 session of the Legislature,

59. Government of Alberta, An Act to Ratify Agreement with the Dominion Government, 1941, Chapter 72, Schedule B.

60. Government of Alberta, The Oil and Gas Wells Act, 1942, Chapter 7, Section 7.

61. Government of Alberta, An Act to Ratify a Certain Agreement between the Government of the Dominion of Canada and the Government of the Province of Alberta, Chapter 8.

losses were still considered to be serious enough to justify a new Act called the Natural Gas Utilities Act, the purpose of which was stated to be the prevention of wastage of natural gas and the ensuring of equitable distribution. The Minister of Lands and Mines, the Honourable N. E. Tanner, stated that the Act "will require gas produced but not needed at the present time to be returned to the structure for future use."⁶²

Section 3 of the Act set up a Natural Gas Utilities Board comprising two members, one being the chairman of the Board of Public Utility Commissioners, and the other the chairman of the Petroleum and Natural Gas Conservation Board.⁶³

With reference to this Act, the statement was made that loss of natural gas in Turner Valley had been due to the fact that "one producing company enjoyed the exclusive rights to supply the natural gas markets."⁶⁴ Under the Act, all natural gas wells were now considered to be public utilities, and their marketing therefore to be under the authority of the Board of Public Utilities Commissioners, whose chairman was also chairman of the new Natural Gas Utilities Board.

The latter Board was to have power to deal with all public utilities as defined by the Act, including pipe lines, scrubbing plants, and wells or plants producing natural gas. For its duties it was given "all such power, rights and privileges as are vested in the Supreme Court of Alberta,"⁶⁵ thus facilitating such matters as enforcing orders, inspection, and examin-

62. Edmonton Journal, March 1, 1945.

63. Government of Alberta, Natural Gas Utilities Act, 1944, Chapter 4, Section 3.

64. Government of Alberta, Synopsis of Statutes of General Application, 1944, 6.

65. Government of Alberta, The Natural Gas Utilities Act, 1944, Chapter 4, Sections 18, 19.

ing witnesses.

In spite of the efforts of these Boards and the legislation and regulations which they had at their disposal, Alberta petroleum production declined from 1941-42 until 1947.⁶⁶ Maximum conservation from a technical or engineering standpoint could not be maintained under wartime conditions when greatest possible immediate production was required. Indeed, this was a clear example of a situation in which social and political considerations dominated the technical aspects in conservation policy.

For a time, the exhausting effect of the wartime production methods could not be overcome even by "an enormous exploration program,"⁶⁷ the extent of which can be judged by the following table. In this connection it should be noted that prospecting reservations refer to the areas granted to groups or individuals for prospecting purposes, which from 1941 to 1947 was set at a maximum area of 200,000 acres per reservation, with a maximum of three reservations to any one person at a time. Drilling reservations were areas within such prospecting acreages on which the individual or group applied for and was granted drilling rights. In this same period, "The number of acres to be included in a group for drilling" had a maximum of 19,200 acres.⁶⁸

TABLE 9

Acreages of Permits and Reservations Granted, 1938-1946.⁶⁹

66. Cf. above, Chapter 2.

67. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. L, Part 2, 1945-46), 9.

68. Government of Alberta, Department of Mines and Minerals, Submission to Royal Commission on Energy, 1958, 11.

69. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. L, Part 2, 1945-46), 87.

<u>Fiscal Years</u>	<u>Prospecting Reservations</u>	<u>Drilling Reservations</u> ^x
1938-39	334,600	-----
1939-40	475,881	-----
1940-41	638,889	-----
1941-42	4,058,116	-----
1942-43	1,103,059	-----
1943-44	3,775,695	61,863
1944-45	3,294,496	248,157
1945-46	5,058,928	102,373

^x First classified apart from prospecting reservations in 1943-44.

At the close of the year 1945-46, the active drilling reservations, as opposed to those which showed no operations, constituted 43,915 acres, while the active prospecting reservations totalled 4,595,311 acres. This meant that over 40 percent of the land held for drilling had such activity under way, while over 90 percent of the prospecting reservations were being worked.

This activity, combined with the geological and geophysical knowledge which had been accumulated over the years, made it certain that sooner or later the vast new fields which Alberta possessed would be discovered. In February of 1947, the first well of the Leduc field blew in, an event which was to shift the emphasis of development and exploration from the southern to the northern part of the Province, and which reversed the conditions of gradually declining production into a phase of rapid expansion.

As might be expected, the new expansion brought new problems and opportunities in the field of conservation.

CHAPTER 6

Post-Leduc Conservation and Proration

The era opened up by the Leduc discovery in 1947 was destined to dwarf the achievements of the Turner Valley period, and to put Canada on the road to self-sufficiency and to export in petroleum products. The effect of the Leduc-Calmar production and the subsequent development in Redwater in the first two years is indicated by the following production statistics:

TABLE 10

Alberta Crude Oil Production by Calendar Years, 1937-49.¹

<u>Year</u>	<u>Barrels (35 gallons)^(x)</u>	<u>Valuation[#]</u>
1937	2,797,000	\$ 4,914,000
1938	6,743,000	8,639,000
1939	7,593,000	9,290,000
1940	8,495,000	10,503,000
1941	9,909,000	13,810,000
1942	10,136,000	15,517,000
1943	9,675,000	15,725,000
1944	8,789,000	14,468,000
1945	8,055,000	13,170,000
1946	7,139,000	14,348,000
1947	6,809,000	18,079,000
1948	10,974,000	35,128,000
1949	20,246,000	59,000,000

(x) To nearest thousand barrels.

to nearest thousand dollars. Includes natural gas value.

1. Government of Alberta, Annual Report of Department of Mines and Minerals (Sessional Papers, Vol. LV, 1950-51), 16.

TABLE 1

Estimated Investment and Production

The area opened up by the land reclamation in 1907 was divided into two sections of the Texas Valley project, and to get Texas on the road to self-sufficiency and to export its products. The effect of the land reclamation and the subsequent development in Texas is the following: Texas has been divided into the following sections:

TABLE 1

Estimated Investment and Production, 1907-1910

Year	Investment (\$)	Production (\$)
1907	2,117,000	4,345,000
1908	2,117,000	4,345,000
1909	2,117,000	4,345,000
1910	2,117,000	4,345,000
1911	2,117,000	4,345,000
1912	2,117,000	4,345,000
1913	2,117,000	4,345,000
1914	2,117,000	4,345,000
1915	2,117,000	4,345,000
1916	2,117,000	4,345,000
1917	2,117,000	4,345,000
1918	2,117,000	4,345,000
1919	2,117,000	4,345,000
1920	2,117,000	4,345,000
1921	2,117,000	4,345,000
1922	2,117,000	4,345,000
1923	2,117,000	4,345,000
1924	2,117,000	4,345,000
1925	2,117,000	4,345,000
1926	2,117,000	4,345,000
1927	2,117,000	4,345,000
1928	2,117,000	4,345,000
1929	2,117,000	4,345,000
1930	2,117,000	4,345,000

(a) To estimate investment and production.

(b) To estimate investment and production. Includes annual and other.

The sharp rise in production continued each year until 1956, when a total of 143,910,000 barrels were produced in Alberta.² Decreased marketing in 1957 reduced production allowables to 137,492,000 barrels valued to the producer at \$356,744,000.³

As the Leduc-Calmar field expanded rapidly, and new discoveries were made at Woodbend and Redwater, the need was felt to review, consolidate and improve existing legislation concerning petroleum and natural gas. A first step in this direction was appointment in November, 1948, of a Natural Gas Commission under the chairmanship of Mr. R. J. Dinning.

In reviewing the situation with regard to conservation, the Commission felt that the Petroleum and Natural Gas Conservation Board had achieved commendable results in comparison with those achieved in the Turner Valley period. It was recognized that flaring of gas, especially in the discovery and early production phase of a field, cannot be altogether avoided economically. Market conditions were felt to be a major factor in determining what conservation costs could be justified.

At the time, market outlets were readily available, and this, combined with other factors such as efficient storage and repressuring techniques, led the Commission to the conclusion that gas losses should be "eliminated" in the near future.⁴ Because of the value of the liquids contained in gas, it was felt that the producing companies could not afford to flare such gas, but instead would process it for the liquids and then either market

2. Canadian Petroleum Association, Statistical Year Book, 1956, 14.

3. The Petroleum and Natural Gas Conservation Board, Alberta Oil and Gas Industry, 1957.

4. Government of Alberta, Report of Natural Gas Commission, 1949, 88.

the residual gas or return it to the reservoir for selling when markets became available. In the latter case it was not expected that shrinkage would exceed fifteen percent.

The Commission report included a submission by Dr. G. W. Govier summarizing the policy of the Conservation Board with respect to the different types of gas.

Regarding dry gas, i.e., gas not containing economically recoverable liquids, the policy was "Complete prevention of production of gas beyond the amount which may be effectively utilized or stored."⁵

The policy with regard to wet gas without commercial quantities of liquid petroleum was similar to that for dry gas, except that the recovery of economical liquid hydrocarbons was required.

In the case of wet gas containing commercial quantities of liquid petroleum, or of "solution" gas, i.e. gas dissolved in liquid petroleum, a "reasonable" waste was tolerated. In the Leduc and Redwater fields at the time, it was felt that it was uneconomical to gather all the gas which appeared with the oil, and that some such loss could be tolerated on the premise that the gas had been used, in a sense, by acting as a lifting agent for the oil. The removal of liquid hydrocarbons was required wherever their value made such recovery economical. In such cases the residual gas was to receive "complete effective use or storage."⁶ This would mainly involve strategic re-injection into the reservoir for pressure maintenance.

With respect to gas-cap gas, which overlies the liquid petroleum and

5. Government of Alberta, Report of Natural Gas Commission, 1949, 23.

6. Ibid., 24.

The Commission has no objection to the Government's proposal to continue the existing policy in the light of the fact that it was not expected that the Commission would exercise its powers.

The Commission has no objection to the Government's proposal to continue the existing policy in the light of the fact that it was not expected that the Commission would exercise its powers.

Regarding the fact that the Commission has no objection to the Government's proposal to continue the existing policy in the light of the fact that it was not expected that the Commission would exercise its powers.

The Commission has no objection to the Government's proposal to continue the existing policy in the light of the fact that it was not expected that the Commission would exercise its powers.

In the case of the fact that the Commission has no objection to the Government's proposal to continue the existing policy in the light of the fact that it was not expected that the Commission would exercise its powers.

Regarding the fact that the Commission has no objection to the Government's proposal to continue the existing policy in the light of the fact that it was not expected that the Commission would exercise its powers.

The Commission has no objection to the Government's proposal to continue the existing policy in the light of the fact that it was not expected that the Commission would exercise its powers.

Regarding the fact that the Commission has no objection to the Government's proposal to continue the existing policy in the light of the fact that it was not expected that the Commission would exercise its powers.

Will report to the Commission on the fact that the Commission has no objection to the Government's proposal to continue the existing policy in the light of the fact that it was not expected that the Commission would exercise its powers.

need not necessarily be produced with it, the policy was to prevent production of such gas as long as it was "economically aiding in the recovery of liquid petroleum underlying it."⁷ Production for removal of liquid hydrocarbons such as propane and butane was permissible so long as the residue gas was returned to the reservoir, and the well was operated so as to cause no damage to the productivity of the pool.

For gas-condensate gas, from reservoirs such as those at Jumping Pound and Pincher Creek, where gas and liquids exist in a single phase as a volatile hydrocarbon liquid, production methods are especially important if losses are to be avoided. Detailed sample analysis is required, and on this depends the decision as to whether residue gas must be re-injected for pressure maintenance or whether it may be otherwise utilized.

Assuming that a gas export plan would make a gas gathering pipe-line grid feasible in the Province, the Commission saw such a grid as an aid to conservation. Through common purchase arrangements as in Turner Valley, or through unit operation with which Jumping Pound was then experimenting, exporters would be able to obtain their requirements in co-ordination with conservation policy. Priority could be given to residue gas, and certain fields could be designated as reserve or storage fields.

The Commission report was made available to the Legislature in March, 1949, and was thus available for reference at the special session of the Legislature held in July, 1949, at which petroleum legislation received a major revision. The Oil and Gas Resources Conservation Act was amended so as to replace the Natural Gas Utilities Act and the Pipe Line Regulation

7. Government of Alberta, Report of Natural Gas Commission, 1949, 25.

Act, as well as consolidating and amending the previous Oil and Gas Resources Conservation Act of 1938. This amalgamation of Acts was part of the government's preparation for expansion of Alberta's markets, including export of gas. The Minister of Mines and Minerals, the Honourable N.E. Tanner, warned that "immediate construction of an oil outlet was urgent because Alberta Oil production figures rapidly were overtaking the refinery capacity."⁸

One such outlet was achieved in 1950 with the putting into operation of the Interprovincial Pipeline to transport crude oil to eastern refineries. "The full significance of this line to the Alberta producer appeared in April, 1951 when the Ontario demand was responsible for increasing Alberta market allowables to the extent of twenty-two thousand barrels a day."⁹

In addition, refinery capacity in Western Canada was increasing so that by 1952 a daily capacity of approximately 220,000 barrels had been added to 1946 refining capacity.¹⁰

The expansion of markets for crude oil is indicated by the following table:¹¹

TABLE 11

Summary of Shipments of Alberta Crude Oil, 1947-1953

(Quantities in Thousands of Barrels)

	<u>Saskatchewan</u>	<u>Manitoba</u>	<u>Ontario</u>	<u>B.C.</u>	<u>U.S.A.</u>	<u>Total</u>
1947	528	627	-	-	-	1,155

8. Edmonton Journal, February 19, 1949.

9. Petroleum and Natural Gas Conservation Board, Annual Review of the Alberta Oil and Gas Industry, 1952, 19.

10. Ibid., 24.

11. Ibid., 1953, 24.

	<u>Saskatchewan</u>	<u>Manitoba</u>	<u>Ontario</u>	<u>B.C.</u>	<u>U.S.A.</u>	<u>Total</u>
1948	2,488	741	-	-	-	3,229
1949	6,746	1,194	-	-	-	7,940
1950	9,405	1,587	-	-	-	10,992
1951	11,084	4,585	13,666	-	463	29,798
1952	11,854	6,091	19,972	509	1,116	39,543
1953	14,372	5,541	23,439	2,680	2,192	48,223

As far as the market for refined products was concerned, the expansion must be judged in relation to shipments in from other parts of Canada and from the United States. The net positions are indicated in Table 12.¹²

TABLE 12

Production, Consumption and Shipments of Petroleum Fuels
into and out of Alberta, 1947-53.

(Quantities in Thousands of Barrels)

	<u>Production</u>	<u>Consumption</u>	<u>Shipments Out</u>	<u>Shipments In, Canada</u>	<u>Shipments In, U.S.A.</u>	<u>Net Shipments</u>
1947	6,621	6,751	595	495	312	- 212
1948	7,822	7,475	1,154	611	554	- 11
1949	10,950	8,942	1,894	273	116	+ 1,505
1950	13,565	10,237	3,128	215	37	+ 2,876
1951	15,665	11,991	3,359	358	8	+ 2,993
1952	17,787	13,605	4,433	381	43	+ 4,009
1953	19,254	15,364	3,915	980	107	+ 2,828

The decrease in the Net Shipments out in 1953 was caused by an increase

12. Petroleum and Natural Gas Conservation Board, Annual Review of the Alberta Oil and Gas Industry, 1953, 37.

Year	1950	1951	1952	1953	1954	1955
1950	1,000	1,000	1,000	1,000	1,000	1,000
1951	1,000	1,000	1,000	1,000	1,000	1,000
1952	1,000	1,000	1,000	1,000	1,000	1,000
1953	1,000	1,000	1,000	1,000	1,000	1,000
1954	1,000	1,000	1,000	1,000	1,000	1,000
1955	1,000	1,000	1,000	1,000	1,000	1,000

As far as the matter for further production was concerned, the situation

was not subject to revision in the course of the year.

From the above it can be seen that the production was not subject to revision.

TABLE 1

Production, consumption and stocks of various types of goods and services, 1950-1955

(Data listed in thousands of tons)

Year	1950	1951	1952	1953	1954	1955
1950	1,000	1,000	1,000	1,000	1,000	1,000
1951	1,000	1,000	1,000	1,000	1,000	1,000
1952	1,000	1,000	1,000	1,000	1,000	1,000
1953	1,000	1,000	1,000	1,000	1,000	1,000
1954	1,000	1,000	1,000	1,000	1,000	1,000
1955	1,000	1,000	1,000	1,000	1,000	1,000

The figures in the above table are in thousands of tons.

As far as the matter for further production was concerned, the situation was not subject to revision in the course of the year.

of nearly 2 million barrels in Alberta consumption over that of 1952, and a sharp increase in the import of refined products from Saskatchewan.

Although natural gas was not being marketed outside the Province in 1949 when the conservation laws were being consolidated and revised, it was not difficult to forecast that the new quantities becoming available would soon raise the question of the need for export outlets and for legislation to deal with such an eventuality.¹³

Anticipating these various market developments, the revised conservation laws of 1949 restated and enlarged the powers of the Petroleum and Natural Gas Conservation Board to carry out conservation, to prevent "waste" and to give each owner his "just and equitable share of the production of any pool."¹⁴ The Board was also authorized to fix a provincial allowable for oil and gas, and to allocate this among the different pools, and within the pool to the different operators.

Waste was made an offence, and the definition of waste was given a wide meaning. Included as being wasteful were: improper use of reservoir energy, location of wells in a manner to reduce the amount ultimately recoverable, inefficient storage, production in excess of transportation or market capabilities, and handling so as to cause excessive surface loss or destruction of oil or gas.¹⁵ Carbon black production was included in the category of waste, and was prohibited. Formerly, when gas was of little value, this product could be profitably used in the manufacture of rubber, inks, paints, and plastics, but its production from natural gas "is frowned upon by most conservationists because it is wasteful of heat energy."¹⁶

13. Cf., below, Chapter 8, for elaboration of gas export.

14. Government of Alberta, Synopsis of Statutes of General Application, July, 1949, 11.

15. Government of Alberta, Oil and Gas Resources Conservation Act Amendment Act, 1949, Chapter 5.

16. Lester Charles Uren, Petroleum Production Engineering (New York, London, Toronto, 1950), 47.

Another requirement of the Act was the buying of residue gas by gas purchasers if it could be "reasonably" used for the purchaser's requirements. Also, recognizing market effects on production and hence on conservation, the Act gave the Board power to direct gas marketing, and where the prices caused dispute between the parties concerned, then the Board of Public Utility Commissioners obtained the right to determine the prices.¹⁷

Further consolidation of conservation law was effected in 1950, when a new Act was passed amalgamating the 1949 consolidations with the 1942 Oil and Gas Wells Act, which was repealed.¹⁸ Since the Oil and Gas Wells Act had dealt with the many technical aspects of well drilling, and included the objective of conserving gas and oil and preventing waste, its inclusion in conservation legislation was logical from the viewpoint of eliminating legal duplication and confusion.

The new Act thus became a very comprehensive document, divided into seven Parts. Part I deals with the organization and constitution of the Petroleum and Natural Gas Conservation Board, Part II with general powers of the Board, Part III with drilling, completion and abandonment of wells, Part IV with oil and gas production, Part V with gathering and disposition of oil and gas, Part VI with taxation and Part VII with provisions of a general nature.¹⁹

Also present in the new Act were some of the drilling and production regulations, including the regulations concerning the promotion of and as-

17. Government of Alberta, Oil and Gas Resources Conservation Act Amendment Act, 1949, Chapter 5, Section 16.

18. Government of Alberta, Oil and Gas Resources Conservation Act, 1950, Chapter 46.

19. Ibid.

sistance to unit operations schemes by the Board, production reports on wells, and Board access to wells, oil and gas plants, and records. This statutory declaration of Board powers was in accord with the recommendations of the McGillivray Commission which had said

...that in our view if a statutory body is to be given power to interfere with the common law rights of individuals, it is only right that those powers should be specifically declared, first so that the statutory body may know what its power is, and second so that those who may be adversely affected may see to it that it does not exceed the authority which has been conferred upon it by the Legislature.²⁰

In any modernizing and consolidation of legislation involving extensive detail such as in this Act, it is reasonable to assume that considerable subsequent amendment will become necessary as practical application exposes weaknesses. In this case the original draft stood up well, being subjected to only minor adjustments in the ensuing five years. An example of the type of change made was the 1951 addition to Section 15 authorizing the Petroleum and Natural Gas Conservation Board to obtain the services of professional persons necessary for the transaction of its business. The new clause authorizes the appointment of experts to inquire into specific matters coming before the Board.²¹ Another example appears in connection with Section 19 of the Act which requires an applicant for a license to file a plan showing measurements from some definite established mark. In 1952, this had to be clarified so that it would be meaningful in unsurveyed territory where increased activity was developing.²² Even in the matters of keeping records and filing returns, changes become necessary from time to

20. Government of Alberta, Alberta's Oil Industry (Edmonton, 1940), 223.

21. Government of Alberta, Synopsis of Statutes of General Application, 1951, 85.

22. Ibid., 1952, 85.

2.6 DMC

time "to keep abreast of the changing conditions and new elements entering the petroleum and allied industries."²³

When several years of such amendments have accumulated, efficiency of reference usually makes necessary another major revision. The 1950 Oil and Gas Resources Conservation Act with amendments was thus revised in 1957.²⁴

In addition to minor amendments and consolidations, the major change in the new Act concerned Part VIII dealing with unit operations. Sections 75 to 82 were not proclaimed with the rest of the Act on the first of July, 1957. These sections empower the Provincial Government to enforce compulsory unitization of any oil or natural gas pool. Premier Manning explained that this was usually voluntary, and that this part of the Act would not be proclaimed until the government considered the action necessary.

This unproclaimed section instructed the Board to "encourage owners of oil and gas interests...to...combine their interests..." to achieve more efficient development, "irrespective of whether that purpose is accomplished by unit operation, co-operative development or joint participation." Where owners cannot agree on a unit principle, "any such owner may apply to the Board to have the field, pool, or part thereof operated as a unit."²⁵

If it is proved to the satisfaction of the Board that additional areas are "underlaid by the pool that is the common source of supply of oil or gas for the unit operation", these areas may be added to the unit.

In the Legislature, Liberal leader J. Harper Prowse attacked the post-

23. Government of Alberta, Synopsis of Statutes of General Application, 1951, 86.

24. Government of Alberta, Oil and Gas Resources Conservation Act, 1957, Chapter 63.

25. Ibid., Section 75.

ponement of proclamation of Sections 75-82 of the Act, arguing that immediate passage would ensure that no advantage would be taken of delay in making the provisions lawful. He said, "Let's come out right now and say that if necessary we are prepared to put this compulsion into effect."²⁶

Premier Manning denied that there would be any delay, in that the Cabinet could pass the order within twelve hours. He thus left the impression that the government still hoped for satisfactory results from voluntary unitization if this were stimulated by impending but not actual compulsion.

Three new agreements for unit operation were announced at the same session. One applied to all petroleum and natural gas in Section 17, Township 26, Range 6, west of the Fifth Meridian. Another concerned the Acheson North D2 pool near Winterburn. A third pertained to the Westeros field, an area of 3,700 acres in the Leduc formation.

The need for production agreements was emphasised in 1957 because of the reduction in market demand. The yearly output was down 7 million barrels over that of 1956, and while potential output at the end of 1957 was placed at 800,000 barrels daily, "actual output did not exceed 450,000 barrels and at times was well below that level."²⁷ In fact, prorated production fell to 281,710 barrels daily in the last week of November, 1957.²⁸ The reduced market was caused by such factors as replacement of some Alberta Oil in the northwest United States by shipments from the Middle East and Venezuela.

26. Edmonton Journal, April 4, 1957.

27. Government of Canada, Canada, 1958, (Ottawa, 1958), 101.

28. Edmonton Journal, November 30, 1957.

This situation served to emphasise the fact pointed out by the McGillivray Commission that "true conservation of petroleum necessarily involves Proration," with "ratable takings and an adjustment of restricted flow to balance the requirements of the market."²⁹ As previously indicated,³⁰ proration has two main objectives, stabilization of the market and promotion of conservation. Regulation of the rate of production serves both to adjust supply to the demand and to achieve "more efficient use of reservoir energy, assuring higher ultimate recovery than would be obtainable under unrestricted flow."³¹

The Alberta Petroleum and Natural Gas Conservation Board, in consultation with the producers, developed a proration formula in 1950 which has since remained in effect.

At monthly public hearings, purchasers of crude oil make "nominations" in which they indicate their requirements for the following month. From these nominations a provincial demand is determined which is then allocated to the various wells and pools.³²

The formula for allocation includes a minimum allowance based on operating costs, return on capital invested, or the cost of drilling. This is called the economic allowance, and is the predominant factor in winter months when demand is low and in many cases approaches the economic minimum. In summer, with higher demand, the second factor in the formula predominates, i.e. the prorated share, based on the proportionate relationships of pool

29. Government of Alberta, Alberta's Oil Industry (Edmonton, 1940) 224.

30. Cf., above, Chapter 4.

31. Lester Charles Uren, Petroleum Production Engineering (New York, Toronto, London, 1950), 570.

32. Government of Alberta, Annual Review of the Alberta Oil and Gas Industry, 1952, 18.

This situation must be remedied for each country and for the

United Nations. The United Nations must be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

The United Nations must be able to provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

The United Nations must be able to provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

provide for the needs of the people and to be able to

27. Government of Canada, Report of the Commission on the Status of Women, 1964, p. 22.

28. Report of the Commission on the Status of Women, 1964, p. 22.

29. Report of the Commission on the Status of Women, 1964, p. 22.

30. Report of the Commission on the Status of Women, 1964, p. 22.

potentials in excess of the minimum economic allowance. The economic allowance as well as the M.P.R. (Maximum Production Rate), is based on an average for the whole pool.³³

Thus, the economic allowances are first deducted from the provincial demand, and the residual demand is distributed on the basis of the prorated share. In the case of a pool allowance being more than its potential, i.e., the pool being unable to meet its economic minimum, the allowable is reduced to the potential, and the extra demand is then re-prorated amongst pools capable of meeting it.³⁴

In order to ensure that producers abide by the allowables, for over-production in excess of 10 percent above the allowable a penalty is imposed by which the operator "may be required to shut in the well until the over-production is cut down."³⁵

Besides prorationing, other conservation measures are established and developed by the Board. Repressuring by injecting gas or water back into the pool has done much to increase recoverability. Gas injection in Golden Spike D-3 pool raised pressure from 1400 pounds per square inch in 1953 to 1700 psi in 1956, and is expected to produce 88,000,000 barrels more oil than under natural recovery methods.³⁶

Other gas injection schemes are operating at Campbell, Duhamel, and Turner Valley. Several water injection schemes have been started in the Pembina field, in Leduc-Woodbend and in Joffre. One company estimates that

33. Vernon Millard, Proration to Market Demand, (Calgary, 1952). (mimeographed), 4.

34. Ibid., 5.

35. Government of Alberta, Alberta's Oil and Gas Conservation Act and Conservation Board, 5, (mimeographed).

36. Ibid., 6.

provision in respect of the various economic activities. The economic situation is well as the 1975 (Economic Prospects 1975), as shown in the average for the whole year.

Thus, the economic situation has been affected from the structural

changes, and has resulted in a situation of stagnation in the early 1970s.

On the other hand, in the case of a good situation being reached the situation is

that, the pool being made in the case of economic stagnation, the situation is

reflected in the situation, and the entire system is thus re-processed through

the system of working it.

In order to ensure that provision is made for the situation, the year-

provision in respect of the various economic activities is provided in respect

of which the system may be required to act in the early 1970s and even

provision is made for it.

Provision is made, when necessary, when necessary, when necessary, and

developed in the early 1970s. The situation is that, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

the pool has been made in the case of economic stagnation, the situation is that

water injection in 80 wells will increase oil recovery by 20,000,000 barrels valued at \$53,000,000.³⁶

To deal with the old problem of surplus gas produced with oil, the processing of such gas to remove propane, butane and natural gas is a strict policy. The residue gas is then sold or re-injected. Such gas processing plants are operating at Turner Valley, Leduc, Bonnie Glen, Redwater and Nevis.

Thus, the main aspects of good conservation policy are being applied in Alberta during the post-Leduc period, including technical and engineering advances, adjustments to market conditions, and consideration of equity factors. As these aspects have changed, policy has been adjusted. This has been and will be a continuing process. The results so far lend substance to the observation that "the achievements of the industry and of the Petroleum and Natural Gas Conservation Board, in reducing waste and conserving gas, have been commendable."³⁷

37. Government of Alberta, Report of Natural Gas Commission, 1949, 126.

water retention in the soil will increase all the more so, the more
the water is retained in the soil.

To test this, the soil samples of various types and depths were

examined at a depth of 10 cm. for water retention, and the results are as

follows. The results are in the table on the opposite page.

Proportion of water retained in the soil, 10 cm. depth, 10 cm.

water and soil.

Thus, the results of the water retention tests are being made

to assist in the soil-water balance, including the water and

the water, and the results are being made, and the results are being

made. As these results are being made, the results are being

made and will be a combined result. The results are being made

to the results of the water retention tests, and the results are being

made and will be a combined result. The results are being made

and, have been made.

CHAPTER 7

Land Policies

The Federal government's Department of the Interior owned about 95 per- cent of the lands in the prairie provinces, including the mineral rights, after 1870, when Rupert's Land was transferred to the Crown. In 1881, the C.P.R. received a land subsidy in return for building a railway to link the eastern provinces with British Columbia. This involved the odd numbered sections in each township, with the exception of school sections numbered 11 and 29, in a belt 20 miles wide on each side of the main line.¹

The Hudson's Bay Company had retained 7,000,000 acres of land as part of the compensation agreement when Rupert's Land was transferred to the Crown. It sold most of these lands to homesteaders, and mineral rights went with the title until 1908, when the Company reserved them. The Cal- gary and Edmonton Corporation received a land subsidy similar to that of the C.P.R. for building a railroad from Calgary to Edmonton. This Corporation retained the mineral rights on its lands, being 1,250,000 acres, when its railroad operation was taken over by the C.P.R.² Mineral rights also went with the Dominion lands sold or homesteaded until 1887, after which they were reserved to the Crown. Homesteads purchased from the C.P.R. retained mineral rights until 1902.

The decisions by those selling land to begin reserving the mineral rights were a result of the growing realization of the value of such rights.

One of the first Acts passed by the Alberta government after its forma- tion in 1905 was the Land Titles Act, providing for the recording of the title

1. Floyd K. Beach, "An Engineer Looks at the Law," Canadian Oil and Gas Industry (May, 1954).

2. D. Lewis and R. Thompson, Canadian Oil and Gas (Toronto, 1958), Book I, Part I, Section 4.

in one of the Provincial offices, with the owner receiving a duplicate certificate. If the minerals were reserved to the Crown or held by others than the owner, this fact appeared on the certificate of title.

The first prospecting applications were made to the Federal government in 1898. By Order-in-Council, the Minister of the Interior was authorized to permit an applicant to make a prospecting reserve of not more than 640 acres, for the purpose of petroleum prospecting. If oil was found in paying quantity, there was a provision to sell the land to the applicant for one dollar an acre, with the Crown to obtain a royalty of $2\frac{1}{2}$ percent on the sales of petroleum. This Order applied to the area south of the C.P.R. in what was then known as the District of Alberta.

In 1901, the government felt it to be no longer in the public interest to allow an applicant any particular area of land for prospecting purposes. All unappropriated Dominion lands in what is now Alberta were opened to prospecting by any individual or company so desiring. However, anyone finding petroleum could buy up to 640 acres at one dollar an acre, subject to royalty as prescribed from time to time.³

By 1904, an operator was permitted to reserve up to 1,920 acres if he was installing machinery, and if oil was found, he could purchase the first 640 acres at one dollar an acre and the remainder at three dollars an acre. The patent to the land would include surface rights and petroleum rights, but excluded all other minerals. Subsequently, various amendments and adjustments were made regarding duration of reserves, installation of machinery, and other matters.

All previous regulations were rescinded in 1910, and a system of ren-

3. Government of Alberta, Brief to the Royal Commission on Energy
(Calgary, February, 1958), 2.

tals was set up instead of sales. By that time 16,028 acres had been sold, including 1,541 acres in Waterton National Park, 1,762 acres in Bow Island field, and 12,725 acres near McMurray.

The first regulations, applying to all Dominion lands in Alberta, included a rental of twenty-five cents an acre for the first year and fifty cents an acre for each succeeding year, with a maximum area of 1,920 acres, provisions for installing machinery within one year, no royalties until January 1930, and then as specified by Order in Council.⁴ The rentals for the second and third year of the lease could be met by credits allowed for approved expenditures in drilling.

Between 1910 and 1930, the rentals were doubled, the credit for drilling expenditures was extended to the fourth and fifth years, and in 1922, grouping of leases was permitted with the maximum area in a group being extended to 20,000 acres.

Regulations on prospecting permits were established in 1928, with rentals of ten cents an acre, for a term of one year, on a maximum area of 1,920 acres, with exploration expenditures being applicable toward the first year's rental.⁵

Operators pressed for some commitments as to what royalty would be charged after January, 1930. The royalty was first set at from $2\frac{1}{2}$ percent to 5 percent of sales of products for the first five years after oil was discovered in commercial quantities, from 5 percent to 10 percent for the second five years, and thereafter at 10 percent. In July, 1929, the Minister of the

4. Canada Gazette, Volume xlv, 1234.

5. Government of Alberta, Brief to the Royal Commission on Energy, 1958, 6, 7.

Interior announced that after January 1, 1930, a royalty of 5 percent on petroleum and naphtha would be payable by all holders of petroleum and natural gas leases, with no royalty being set for sales of natural gas.⁶

In 1930, the Province of Alberta obtained the lands and the mineral rights from the Dominion. The distribution of mineral rights was then as follows:⁷

TABLE 13

Distribution of Mineral Rights, Alberta, 1930.

Total area of the Province	163,382,400 acres
Area in Dominion Parks reserved to Dominion	13,434,240 "
Area in Indian Reserves reserved to Dominion	1,328,090 "
Held in freehold, including railroad grants	16,000,000 "
Mineral rights held by Province	132,620,070 "

The distribution across the Province was far from even. For example, in a large area between Calgary and Medicine Hat, the C.P.R. held the title to all the lands except those held by the Hudson's Bay Company.⁸

The Federal statutes and regulations were continued until the Provincial Lands Act of 1931 came into force. The regulations under this Act were almost indetical to the ones previously in effect under the Dominion. The royalty of 5 percent on oil sales continued unchanged until January 1935, when a rate of 10 percent was set, to continue for the following five years.⁹

6. Government of Alberta, Brief to the Royal Commission on Energy, 1958, 8.

7. Government of Alberta, Report of Natural Gas Commission, 1949, 27.

8. Ibid.

9. Government of Alberta, Brief to Royal Commission on Energy, 1958, 12.

As geology and geophysics improved methods of exploration, the need for larger prospecting acreages became apparent. In 1936, the regulations were amended, eliminating the former maximum of 1,920 acres, and putting the areas granted at the discretion of the Minister of Lands and Mines. Groups of leases were permitted up to a maximum of 50,000 acres, and drilling credits could satisfy lease rentals up to and including the twelfth year of the lease.

The following year, the prospecting permit regulations were rescinded and replaced by Regulations Governing Petroleum and Natural Gas Reservations, which allowed up to 50,000 acres to be included in a reservation.¹⁰ This was increased in 1941 to 200,000 acres, with one person being permitted to hold up to three reservations in his own name at any one time. Also in 1941, the Crown petroleum and natural gas rights obtainable under lease by application were increased from 1,920 to 9,600 acres.

At this time the royalty to be collected on natural gas was fixed by Order-in-Council. Gas usefully consumed off the location of production, or sold, was charged "15 percent of the selling price or fair value at the time and place of production" provided that in no event the royalty would be less than three-quarters of a cent per thousand feet.¹¹

On other petroleum products, the royalty was stated as

that percentage of the products obtained equivalent to the square root of the average daily production, subject to a maximum royalty of 15% and a minimum of 5% and also subject to the proviso that with the first return for the well an election could be made to pay royalty until the end of May, 1951, at 12½% of all products, other than natural gas, instead of on the square root formula.¹²

-
10. Government of Alberta, Brief to Royal Commission on Energy, 1958, 11.
 11. Government of Alberta, Department of Lands and Mines, Order-in-Council 659/43.
 12. Government of Alberta, Brief to Royal Commission on Energy, 1958, 12, 13.

The geological and geophysical investigations conducted by the Geological Survey of Canada, and the results of these investigations, are being used by the Department of the Interior, and the Department of the Environment, for the purpose of determining the extent of the mineral resources of the Province of Alberta, and for the purpose of determining the extent of the mineral resources of the Province of Alberta, and for the purpose of determining the extent of the mineral resources of the Province of Alberta.

The following report, the results of the investigations conducted by the Geological Survey of Canada, and the results of these investigations, are being used by the Department of the Interior, and the Department of the Environment, for the purpose of determining the extent of the mineral resources of the Province of Alberta, and for the purpose of determining the extent of the mineral resources of the Province of Alberta, and for the purpose of determining the extent of the mineral resources of the Province of Alberta.

At this time the report is being used by the Department of the Interior, and the Department of the Environment, for the purpose of determining the extent of the mineral resources of the Province of Alberta, and for the purpose of determining the extent of the mineral resources of the Province of Alberta, and for the purpose of determining the extent of the mineral resources of the Province of Alberta.

The following report, the results of the investigations conducted by the Geological Survey of Canada, and the results of these investigations, are being used by the Department of the Interior, and the Department of the Environment, for the purpose of determining the extent of the mineral resources of the Province of Alberta, and for the purpose of determining the extent of the mineral resources of the Province of Alberta, and for the purpose of determining the extent of the mineral resources of the Province of Alberta.

10. Government of Alberta, Report of the Geological Survey of Canada, 1911.
11. Government of Alberta, Report of the Geological Survey of Canada, 1912.
12. Government of Alberta, Report of the Geological Survey of Canada, 1913.
13. Government of Alberta, Report of the Geological Survey of Canada, 1914.

At this time a total of 4,014 leases were active in Alberta, containing an area of 908,742 acres. At the close of the year, 1941, 559,120 acres were under reservation. During that fiscal year, bonuses through sale by public tender of petroleum and natural gas rights formerly comprised in cancelled leases or reservations amounted to \$3,741.13.¹³

By Order-in-Council, in 1942, provision was made for granting credit for expenditures incurred in drilling, "and such credit could be applied to the rental for the first year of leases following the reservations but not to exceed an area of 50,000 acres."¹⁴

In 1945, rentals satisfied by exploratory and development work totalled \$1,412,458.09. In the same year, the Mineral Taxation Act was passed, with provision for the Minister to declare certain areas producing areas, extended to include property within five-eighths of a mile of a mine or well which is producing or has produced minerals. Such areas were subject to a tax not exceeding five cents an acre, compared to previous regulations on non-producing areas with a rate not exceeding one-half cent per acre.¹⁵

Owing to the rapid expansion of leasing activity after the Leduc discovery, it was found necessary in 1947 to reduce the number of reservations which could be held by any one person at any time to two, each with a maximum area of 100,000 acres. The right to assign reservations was also adjusted to make the maximum size sixteen sections, and requiring that a Crown reserve of equal area should be created in close proximity. In the following year, the maximum lease acreage was reduced to nine sections, with the length

-
13. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. XXXVI, Part 2, 1941-42), 50.
 14. Ibid. (Sessional Papers, Vol. XXXVII, Part 2, 1942-43), 17.
 15. Government of Alberta, Mineral Taxation Act, 1945, Chapter 9.

not to exceed four miles and not to exceed twice the breadth.¹⁶ These measures were designed to prevent individuals or companies from obtaining unfair advantages in selecting choice locations.

The Leduc discoveries also made necessary the Right of Entry Arbitration Act of 1947, providing for a Board of Arbitration of not more than three members, responsible to the Department of Lands and Mines. Operators are obliged to seek agreement with the owner of surface rights, and if they fail to do so, the decision of the Board is final, subject to any reconsideration that the Board itself may undertake.¹⁷

The government was relying on large companies to do most of the exploratory work, and came under criticism for its policy of allotting increasingly large lease areas to such companies. The Hon. N. E. Tanner referred in the legislature to such complaints from smaller independent companies "who haven't spent money on the search." He argued that the only fair policy was to give first consideration on lease rights to companies who had spent millions on the search for oil. His suggestion was that the independent companies could pool their resources to carry out similar work.¹⁸

The matter of several owners being involved in one parcel of land also affected taxation policy. In 1949, to reduce the complications involved in assessing and taxing such parcels, an amendment to the Mineral Taxation Act of 1947 provided that where several persons have fractional interests in one parcel of minerals, all such persons are to be regarded as one owner, and the parcel as one parcel, for purposes of taxation.¹⁹

-
16. Government of Alberta, Annual Report of Department of Lands and Mines (Sessional Papers, Vol. XLIII, Part 2, 1948-49), 106.
 17. Government of Alberta, Right of Entry Arbitration Act, 1947, Ch. 24.
 18. Edmonton Journal, March 20, 1947.
 19. Government of Alberta, Mineral Taxation Act Amendment Act, 1949 (First Session), Chapter 65.

and subject to such agreement with the owner of the rights, and to such

the old To have all at once and no other and I am not

and National Security Council on January 22, 1954. The subject has been discussed

Downloaded from <http://ajphaphysocpharm.sagepub.com/> at
UNIVERSITY OF CALIFORNIA LIBRARY on June 11, 2015

and further to the right, the

The 1949 session also passed a Mines and Minerals Act, which, with amendments, is still the basis for policy at present. In great detail the Act sets forth the powers of the Department of Mines and Minerals with regard to all aspects of renting, leasing, royalties, surveys, and exploration.²⁰

By the year ending March 31, 1950, taxation on petroleum and natural gas lands had yielded the government \$750,721.26, as compared with \$75,120.93 ten years earlier.²¹ This was attributed to the fact that in 1941, only Turner Valley was subject to tax as a producing area, whereas subsequently other major producing areas had been classified as such and had been assessed the increased amount.

In 1951, the government had been defeated in the Legislature by its own backbenchers when it attempted to make provision for repossessing lands on which mineral tax had not been met. Some seizure of land had already been made in lieu of unpaid taxes, and the private members were demanding "some method of regaining mineral rights seized" under these circumstances. They argued that some owners did not even know that they possessed mineral rights subject to tax, and now, because of this lack of knowledge, were about to be deprived of property suddenly become valuable. The proposed legislation designed to amend the Mineral Taxation Act so as to strengthen the government's hand in taking over lands in default of the 1½ cents per acre tax was voted down.²² After the discovery of the Leduc field, mineral rights owners became more alert in keeping up tax payments on their now valuable property.

-
20. Government of Alberta, Mines and Minerals Act, 1949, Chapter 66.
 21. Government of Alberta, Annual Report of Department of Mines and Minerals (Sessional Papers, Vol. VI, Part 2, 1952-53), 48.
 22. Edmonton Journal, March 30, 1951.

In 1951, new royalty regulations came into effect. A sliding scale was set up "applicable to all wells on Crown disposals running from 5 percent to 16 2/3 percent depending on the monthly production...." Royalty on other fluid hydro-carbons and sulphur was set at twelve and one-half percent and on natural gas or residue gas sold or usefully consumed, fifteen percent, of selling price or fair value at the time and place of production, with a minimum of three quarters of one cent per Mcf unless the gas was used to obtain other products. The royalties were to apply until June, 1961, and thereafter unless changed by the Lieutenant-Governor-in-Council.²³

In 1953, the Judicial Committee of the Privy Council handed down judgments concerning the case of the Attorney-General of Alberta vs. Huggard Assets Ltd., in which the latter challenged the right of the province to change the royalty agreement made with the Dominion in 1913. The decision was that "the province now had the power to prescribe and levy a royalty."²⁴

Some protest had arisen over the manner in which the government's policy of retaining 50 percent of the land in any area was working. It was felt that oil companies were able to bunch their half in the most productive sections of a field, leaving to the Crown less valuable areas on the fringe of the pool. Accordingly it was suggested that the Crown reserves should be in one section blocks arranged in checkerboard fashion, alternating with sections leased.²⁵

23. Government of Alberta, Annual Report of Department of Mines and Minerals (Sessional Papers, Vol. XLVII, Part 2, 1952-53), 10.

24. Ibid. (Sessional Papers, Vol. XLVIII, Part 2, 1953-54), 13.

25. Edmonton Journal, March 3, 1950

In 1951, new treaty negotiations were initiated. A similar

was set up "negotiations for the withdrawal of French troops from

Algeria" to the UN General Assembly in the summer of 1951. The

is an article which states that the UN should not be involved in

internal and external affairs of any state and that the UN should

not interfere in the internal affairs of any state and that the UN

should, with a view to the maintenance of international peace and

the well-being of mankind, assist in the realization of the rights

of man, and should, in accordance with the Charter, promote

peace.

In 1951, the General Assembly of the United Nations adopted

the following resolution on the subject of the Algerian situation:

Whereas the Algerian situation is a matter of international concern

and whereas the Algerian situation is a matter of international concern

and whereas the Algerian situation is a matter of international concern

and whereas the Algerian situation is a matter of international concern

and whereas the Algerian situation is a matter of international concern

and whereas the Algerian situation is a matter of international concern

and whereas the Algerian situation is a matter of international concern

and whereas the Algerian situation is a matter of international concern

and whereas the Algerian situation is a matter of international concern

and whereas the Algerian situation is a matter of international concern.

25. General Assembly of the United Nations, 1951, Resolution 1816

General Assembly of the United Nations, 1951, Resolution 1816

General Assembly of the United Nations, 1951, Resolution 1816

General Assembly of the United Nations, 1951, Resolution 1816

The government took steps in this direction in 1952 with a regulation specifying that "locations or concentrations of leases applied for may form a checkerboard pattern or shall be apart one from the other a distance of not less than one mile."²⁶ The Crown reserves were then to comprise, except in special cases, an area of not less than one mile in width surrounding each location or concentration of leases, together with the portions of a checkerboard pattern not permitted under lease, and such other areas as the Minister might select.²⁷

Provisions were made for the disposal of the Crown reserves at the 1951 session, at which the disposition was placed in the hands of the Lieutenant-Governor in Council.²⁸

A question arose in the 1953 session regarding the taxation of mineral rights owners when several of them owned a different mineral in the same area. Premier Manning found it "too involved" to divide the taxation between a number of persons holding rights to different minerals on one piece of land. The policy was to tax each $1\frac{1}{2}\%$ an acre till the minerals were proved, and then to tax on the assessed value of the minerals owned. J. H. Frowse protested the fact that the increased tax took effect before the minerals could be marketed, but the government stood by its policy.²⁹

In 1953, the taxation minimum on oil and gas property was changed from one dollar to three dollars an acre, and the regulations on rentals for natural gas property were amended to prescribe an annual rental of 33 1/3

26. Government of Alberta, Department of Mines and Minerals, Order-in-Council 1707/52.

27. Ibid., O.C. 1783/51.

28. Government of Alberta, Mines and Minerals Act Amendment Act, 1951, Chapter 52.

29. Edmonton Journal, March 31, 1953.

The Government has been in this situation since 1960 with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

policy of not allowing to be established in the country for the

first time a permanent settlement of small or medium size and with a

centa an acre "where a market for gas is available."³⁰

The regulations regarding exploration are summarized in a 1952 Order-in-Council, and are largely technical in nature.³¹ Of particular interest are the areas in which geophysical operations are prohibited. These include areas covered by natural or artificial lakes, areas in which underground mines are located, and any other areas defined as restricted by the Minister of Mines and Minerals. Provincial Parks, Forest Reserves and grounds upon which public institutions and Metis colonies are situated come under the category of restricted areas if the administrative body concerned has not granted permission. The officials in charge of such areas are thus enabled to exercise their judgement in each case as to whether or not the exploration would adversely affect the public interest.

In 1954 regulations, the matter of drilling reservations in Crown reserves was dealt with, and it is provided that a person desiring to obtain such a reservation

shall submit to the Director of Mineral Rights a request that the Petroleum and Natural Gas rights in the Crown reserves for which he wishes to acquire the reservation may be made available for disposal.³²

The Minister may then grant the request with such changes as may seem desirable to him, taking into consideration a variety of factors including engineering, conservation, and marketing as they are related to the area concerned.

A large number of minor changes were made to the land regulations in 1957, when an Amendment Act was passed revising the basic Mines and Minerals

30. Government of Alberta, Annual Report of Department of Mines and Minerals (Sessional Papers, Vol. XLVIII, Part 2, 1953-54), 12.

31. Government of Alberta, Department of Mines and Minerals, Order-in-Council 122/52.

32. Ibid., Sessional Papers, Vol. L, Part 2, 1955-56), 35.

Act of 1949.³³

One of the new sections provided for the Minister to enter into an agreement for the calculation of royalty due to the Crown when Crown petroleum or natural gas is included in a unit operation.³⁴ Part X deals with the bituminous sands, which are assuming increased importance as methods of extraction develop which permit the product to market competitively with oil from other sources. The ten sections of the Act, combined with the original 1949 Act and the regulations connected with them, make up a document of extensive proportions.

Compared with the relatively simple legislation of early provincial jurisdiction, this volume and detail reflect the complexity which has arisen in recent years with respect to petroleum lands policy. New techniques, large new areas, the more intricate economics involved in modern and expanded production, together with the application of more searching and detailed government control, have made land policy a major legislative item.

33. Government of Alberta, Mines and Minerals Act Amendment Act, 1957, Chapter 51.

34. Ibid., Section 300.

CHAPTER 8

The Export of Natural Gas

By 1948, the discovery of the new fields in northern Alberta had made large new potential reserves of oil and gas sufficiently tangible to forewarn the government that a problem with controversial implications would soon require attention. This was the question of the Province reaching the position where export of natural gas would be socially advantageous.

The problem was a complex one, involving many factors, some of which were sufficiently vague to ensure considerable debate. A major issue was the balancing of the proven and estimated reserves of the Province against the needs of domestic and industrial uses within Alberta for the foreseeable future. This in turn involved estimates of the extent and availability of the underground potential, and also estimates of future industrial and population growth and the development of alternative fuels in the future. Since the accuracy of any such estimates could always be questioned, the whole subject readily lent itself to considerable political disagreement.

Under these circumstances, it was not surprising that the government appointed the Dinning Natural Gas Commission in 1948 with instructions to make a rapid but extensive survey of the gas situation for presentation to the legislative session in the spring of 1949.

In discussing the reserves that might be available, the Commission pointed out the necessity of differentiating between gas which might be in the ground and gas which could be recovered. The percentage of existing gas which could be recovered represented a "recovery factor" which might vary considerably, depending on the pressure in the field, and the condition of the underground porous zones affecting the movement of the gas to the withdrawal area.¹ With unfavourable porous structures, the recover-

1. Government of Alberta, Report of Natural Gas Commission, 1949, 46. (This source provides detailed technical analysis of the factors involved in gas recoverability).

ability rate would fall below 50 percent even when using the best repressuring techniques. Under more favourable conditions, 50 percent to 60 percent would be more common, while 80 percent would be considered a high rate of recovery.

Gas containing liquids and a large quantity of impurities such as sulphur would have a lower recovery factor than dry gas, because of the deductions to be made before obtaining dry gas. The Alberta fields then in production were classified as dry gas fields with the exception of wet gas in Turner Valley and Princess, gas condensate in Jumping Pound, and gas-cap and solution gas in Leduc.² "A reasonable recovery factor for (dry) gas..... would be 90 percent," while Leduc "is subject to a recovery factor of 60 percent."³

The availability of gas, i.e. "the rate at which recovery can be affected,"⁴ involves the questions of availability over time and availability in terms of location. The availability over time is related to conservation practice, including the number of wells used to drain the field, the rate of output permitted, and the use of repressuring. The resultant rate of withdrawal "is directly connected to the question of velocity of the gas passing through many pores....The slower the rate of travel...the greater the amount eventually recovered."⁵

Availability with respect to location refers to fields which are too distant from markets or too small to justify the construction of transmission

2. Cf., above, Chapter 4, for definitions of these terms.

3. Government of Alberta, Report of Natural Gas Commission, 1949, 47.

4. Ibid., 46.

5. Ibid., 46.

lines. This in turn is related to the construction of a pipe-line grid connecting the major fields in the Province. Such a grid can avert depletion of local fields where demand is heavy, and at the same time make economical the exploitation of more remote fields which are within range of the grid network. The economies of such a project also include the market available both within the Province and beyond its borders.

Such were the factors concerning which the Commission received much evidence in its efforts to assess the present and future reserves of the Province. Three main viewpoints were suggested as being the basis for judging the future prospects.⁶ These were:

- (1) Past performances regarding additions to known reserves and the industry's record in meeting requirements....
- (2) Analysis of statistical data bearing on the rate of discovery of new gas and the results of drilling operations, including wild cats drilled and number of dry holes....
- (3) Consideration of the areas believed to be favourable for the finding of oil and gas and of the extent to which such areas have already been explored.

The conclusions of the Commission after considering the evidence presented were that "existing and proven" reserves at the time were 4.26 trillion cubic feet, of which 3.49 trillion cubic feet of "marketable, dry, clean gas" would be recoverable;⁷ and that while potential reserves were "inherently speculative," they were "'exceedingly large' and will ultimately prove 'to exceed, many times' the present existing and proven reserves."⁸ One of the witnesses, Dr. T. A. Link, a prominent Canadian geologist, made a specific estimate that the potential reserves were "in the order of at least 50 trillion cubic feet or more...I think that is a very conservative estimate."⁹

6. Government of Alberta, Report of Natural Gas Commission, 1949, 49.

7. Ibid., 117.

8. Ibid., 118.

9. Ibid., 55.

The validity of the estimate can be judged to some extent by the announcement from the Petroleum and Natural Gas Conservation Board on January 1, 1958, to the effect that the proven reserves had increased 2.7 trillion cubic feet in the previous 15 months to reach 21 trillion cubic feet; and that the potential gas reserve was estimated at "60 to 80 trillion cubic feet."¹⁰

Comparing future reserves with future withdrawals, the Commission noted that withdrawals involved gas consumed by flaring, field use, shrinkage, and marketing for domestic, commercial and industrial purposes. The comparisons involved estimates over a fifty year period, using as a basis the 1949 estimate of 4.26 trillion cubic feet of known reserves, with consumption representing 70 percent of net withdrawals, the remainder being used for repressuring, oil production and other field uses.

On this basis, assuming an annual increase in consumption of 3,500,000 Mcf, new discoveries of 100,000,000 Mcf a year were thought to be adequate. The larger amount of the new discoveries is made necessary by the fact that there is a continual process of exhaustion in older fields.

Including export plans as seen at that time, new discoveries of 220,000,000 Mcf a year were felt necessary.¹¹ The actual increase in the reserves, as indicated above, from 4.6 trillion cubic feet to 21 trillion in nine years, indicates that the increase requirements were met many times over. The increase in consumption from 1948 to 1954 was about 50 million Mcf,¹² or more than 8 million Mcf a year on the average, over twice the amount estimated. However, the actual ratio of increased reserves over in-

10. Edmonton Journal, February 5, 1958.

11. Government of Alberta, Report of Natural Gas Commission 1949, 92,93.

12. Government of Alberta, Annual Report of Department of Mines and Minerals (Sessional Papers, Vol. L, 1955-56).

creased withdrawals was much higher than the minimum set up by the Commission so that export on a scale much greater than they had envisaged was certain to seem practical.

Other factors operated to increase the arguments for more export. Loss of gas through flaring was assumed to be approaching elimination because the value of the flared gas would make storage preferable to flaring, and because conservation regulations would insist on such procedures. Also, future consumption of gas was seen to involve a complexity of factors, including growth of population, replacement of coal by gas for domestic use, expansion of industry in the Province, and development of fuels competitive to gas.

In the last category, gasification of the Province's great coal reserves always represented an alternative to natural gas, an alternative which greatly reduced the urgency of preserving the gas supplies. It has been estimated that the world will pass through the peak of its petroleum reserves in about 1990, when the "demand for coal will increase sharply" raising its price to the point where nuclear power will be able to compete economically with it. However, in points where the production costs of coal are especially low, as in the United States and in Alberta, "it seems likely that it will remain our major fuel for a very long time."¹³

The Commission estimated that nuclear power would reach competitive levels with the coal and gas by about 1970,¹⁴ and this estimate now appears to have been about right. A 1958 report by Dr. David A. Keys, scientific ad-

13. Harrison Brown, James Bonner, and John Weir, The Next Hundred Years (New York, 1957), 107.

14. Government of Alberta, Report of Natural Gas Commission, 1949, 90.

viser to Atomic Energy of Canada Limited, announced immediate construction of an experimental nuclear power plant which would produce power "as cheaply as coal" apart from the initial research and development costs. "After the second or third is in operation we believe it will produce more cheaply than oil, coal or natural gas."¹⁵

The costs of producing electricity from natural gas in Alberta are indicated by the Medicine Hat submission to the Commission in which the cost is estimated "at approximately $\frac{1}{4}$ of a cent per Kilowatt hour..."¹⁶ This compares with a statement from the City of Edmonton which reported selling electricity to Calgary Power Limited "at .35 of a cent per kilowatt hour..." on which rate the city "still would make a profit."¹⁷

Regarding the cost estimates for nuclear power, we have the "reasonable assumption that we might have available 10-mill (one cent) nuclear power by the mid 1960s, 7-mill power by the mid 1970s, with the cost gradually approaching 5 mills per kilowatt-hour."

Considering that costs of generating electricity from coal are "between 6 and 7 mills per kilowatt-hour for new coal-fired units in the United States"¹⁸ it seems likely that in the future, the choice between power from coal, gas or nuclear energy will be made largely on the basis of transmission costs to the point of consumption. Certainly, the availability of such alternatives to gas reduces the argument for restriction of gas export in order to conserve future power reserves in the Province.

15. Edmonton Journal, June 9, 1958.

16. Government of Alberta, Report of Natural Gas Commission 1949, 115.

17. Edmonton Journal, March 27, 1956.

18. Harrison Brown, James Bonner, and John Weir, The Next Hundred Years (New York, 1957), 106.

view to Atomic Energy of Canada Limited, mentioned in the report of an experimental nuclear power plant which was in operation near the town of Chalk River from the 1950's to the 1960's. The report on this is in the appendix to this document and shows that it, too, was a failure.

The results of the experimental nuclear power plant were in fact the same as those of the experimental nuclear power plant which was in operation near the town of Chalk River from the 1950's to the 1960's. The report on this is in the appendix to this document and shows that it, too, was a failure.

Regarding the cost of nuclear power, it is estimated that the cost of nuclear power is about 10% of the cost of fossil fuel power. This is based on the assumption that the cost of nuclear power is about 10% of the cost of fossil fuel power.

Regarding the cost of nuclear power, it is estimated that the cost of nuclear power is about 10% of the cost of fossil fuel power. This is based on the assumption that the cost of nuclear power is about 10% of the cost of fossil fuel power.

1. Report of the Atomic Energy of Canada Limited, 1964.
2. Report of the Atomic Energy of Canada Limited, 1965.
3. Report of the Atomic Energy of Canada Limited, 1966.
4. Report of the Atomic Energy of Canada Limited, 1967.
5. Report of the Atomic Energy of Canada Limited, 1968.

Such were the considerations brought to the spring session of the Legislature in 1949 when the Report of the Dinning Commission was presented. Legislative action developed mainly in a second session called in July, 1949, at which the main business was legislative changes concerning petroleum and natural gas. Several Acts were revised and consolidated in the new Natural Gas Utilities Act. Pipe Line Act amendments and changes resulted mainly in transferring more control of such lines to the Petroleum and Natural Gas Conservation Board. The new Gas Resources Preservation Act was of prime importance in connection with possible gas export.

This last Act emphasises its intention "to effect the preservation and conservation of the oil and gas resources of the Province, and to provide for their effective utilization having regard to the present and future needs of the ...Province." ¹⁹

Section 4 of the Act makes necessary the application to the Conservation Board for a permit before any gas is removed from the Province. Details of the conditions which may be prescribed in an export permit are set forth, including the pool from which the gas may be taken, maximum quantities permitted, rates of withdrawal, period of time for which the permit is valid, and the necessity of supplying areas in the Province reasonably adjacent to the exporting facilities.

In effect, this Act was a detailed preparation for regulation of export. It led to controversy both in the legislature and throughout the Province. In the House, J. Harper Prowse and Elmer Roper of Edmonton, and H. J. MacDonald of Calgary led the opposition to the measure.

19. Government of Alberta, Synopsis of Statutes (Second Session, 1949), 6.

...the Commission ... the ... of the ...
...the ... of the ... was ...
...the ... in a ...
...the ... was ...
...the ... were ...
...the ...
...the ...
...the ...
...the ...
...the ...
...the ...
...the ...

...the ...
...the ...
...the ...
...the ...
...the ...
...the ...
...the ...

...the ...
...the ...
...the ...
...the ...
...the ...
...the ...
...the ...
...the ...
...the ...
...the ...

...the ...
...the ...
...the ...
...the ...
...the ...
...the ...
...the ...

The basis of their opposition was the assumption that the future needs of Alberta consumers were not being adequately protected. Prowse described the legislation as representing the "Cabinet taking power over the lives of Alberta citizens."²⁰

Attorney General Maynard and the Minister of Lands and Mines, N. E. Tanner, defended the Bill by emphasizing the provision for conserving gas and protecting the interests of Alberta consumers. They said the Bill was designed to permit export of gas when adequate provision had been made for domestic needs. The difficulty was to decide what the future needs of the Province were likely to be and whether reserves were sufficient to meet this need and still leave an export surplus of sufficient volume to justify the expenditures in transmission lines.

In 1951, limited export to Montana to provide fuel for copper production there was begun. Premier Manning justified this as being essential under the joint defense program. The opposition protested this export and raised the question of high U.S. tariffs against Canadian processed and manufactured copper.²¹ A request for an economic survey before permitting any gas export was voted down by the government. Possibility of export causing an increased rate to domestic consumers was also raised but rejected.

H. J. MacDonald referred to the Dinning Commission recommendation "that Alberta needs should be protected for fifty years" and J. H. Prowse noted that applicants for export permits were now talking in terms of only a twenty years supply.²²

20. Edmonton Journal, July 6, 1949.

21. Ibid., April 3, 1951.

22. Ibid., March 1, 1951

The question of industry being obliged to come to Alberta if the gas were not exported was answered by N. E. Tanner, who stated that only dry gas was to be exported and that the by-products would remain in the province to encourage the industrial development. He gave an example of the by-products which were obtainable from the 100,000,000 cubic feet of daily output from the Pincher Creek field. The amounts were: 3,000 barrels of wet gasoline, 770 barrels of butane, 350 barrels of propane and 480 tons of sulphur.²³

Approval was given in 1952 for gas export from the Peace River area to the Pacific coast by Westcoast Transmission Company. Other bids for export permits were rejected. Premier Manning reported that the reserves of the province were needed locally except for 300 billion cubic feet in the Peace River area.²⁴

New discoveries by 1953 had reached the point at which the Premier was able to state "that Alberta now is in the position that failure to provide an export market will have a 'very detrimental effect' on exploration, not only for natural gas, but also for oil."²⁵

Before the Dinning Commission, the producers, especially the independents, had argued that export of gas would be an important incentive to the further search for oil, since the market for gas would provide an added source of revenue. The Commission noted, however, that even the independents were having substantial success in the search for oil; enough to justify further exploration. It was admitted that new gas markets would encourage a more rapid search for oil, which still remained the strongest attraction,

23. Edmonton Journal, March 6, 1951.

24. Ibid., April 9, 1952.

but the question was whether "it is, at this time, in the public interest to induce a more rapid search for oil."²⁶ They concluded that there seemed to be sufficient impetus without adding more incentive, and that until additional facilities for oil disposal were available, the danger of serious surpluses on the market was present.

In the following year, J. H. Prowse again raised the question of protection for the domestic consumer, and argued that there was a need for legislation "to protect the consumer against high prices of petroleum products,"²⁷ which presumably would result from gas export unless action was taken to prevent it.

The Natural Gas Commission had referred to the fact that

if the market for Alberta gas were expanded by the construction of transmission lines either east or west, or both ways, it will be necessary to build extensive gathering lines to or between many of the gas fields.²⁸

In this regard, the government in 1954 passed the Alberta Gas Trunk Line Company Act, under which it was intended to create a private company in which the government would have some control. Accordingly, the voting shares, called Class A, were divided into four groups, none of which could merge with any other. One group would go to the gas utility companies, who would have one director on the Board of Directors. Another was allocated to the gas export companies who also would have one director. A third group would go to the gas producers and processors, who would have three directors. The fourth group was reserved for persons appointed by the Alberta

26. Government of Alberta, Report of Natural Gas Commission, 1949, 58.

27. Edmonton Journal, February 23, 1954.

28. Government of Alberta, Report of Natural Gas Commission, 1949, 111.

and the question was whether or not, in this case, in the public interest, to allow a more rigid control for oil. The Commission was of the opinion that it was not in the public interest to impose such a control, and that the existing facilities for oil disposal were sufficient, and that no further government action was needed.

In the following year, in 1932, the Commission again raised the question of providing for the domestic economy, and argued that there was a need for legislation to protect the economy against high prices of petroleum products, which would result from the export of petroleum to the United States.

The National Gas Association has taken the position that if the market for domestic gas were expanded by the construction of pipelines for long distance gas, on both sides, it will be necessary to build additional gathering lines to or between any of the fields.

In this regard, the government in 1932 passed the Natural Gas Act, which provided that it was intended to create a private company to own and operate the gas pipelines, and to regulate the rates of service. The government would own and control the existing gas pipelines, and would divide into four groups, two of which would be subject to public control. The group would be in the public interest, and would have one director on the board of directors. Another was intended to be the gas export companies who also would have one director. A third group would be in the gas production and processing, who would have one director. The fourth group was reserved for persons appointed by the board.

-
25. Government of Alaska, Report of Special Gas Commission, 1932, p. 27.
 26. American Gas Association, February 22, 1932.
 27. Government of Alaska, Report of Special Gas Commission, 1932, p. 27.

government, which would have two directors on the Board, to represent the Alberta public at large. Two of the 2,002 voting shares were allocated to the government. In this connection J. H. Prowse argued that the two directors from the Province were "not able" to exercise useful control.²⁹

The proven gas reserves had reached $14\frac{1}{2}$ trillion cubic feet by 1955, and of this amount, the Premier indicated that $4\frac{1}{2}$ trillion cubic feet were earmarked for export. The government was giving support to promotion by Trans-Canada Pipe-Lines Limited of a trans-continental line which would carry the gas gathered in Alberta fields to markets in the East. Nation-wide controversy developed in this case over the issue of the Dominion offering assistance to a private company in financing its ventures.

In a special session of the legislature called in August, 1955, the Gas Resources Preservation Act was amended. More elaborate information was specified as being possibly required from an applicant for export permit. And even more emphasis was placed on the protection of public interest by the amendment to Section 7, (ss-2) of the original Act. which had prohibited the Board from granting an export permit unless the gas, "in the opinion of the Board, is surplus to the present and future needs of the people of the Province."³⁰ This was further elaborated by applying "the test of public interest having regard to the present and future needs of the people of the Province, present reserves, and the trends in growth of reserves of gas in the Province."³¹

29. Edmonton Journal, March 30, 1954.

30. Government of Alberta, Gas Resources Preservation Act, 1949, Chapter 2, Section 7.

31. Government of Alberta, Synopsis of Statutes, August, 1955, 5.

The amended Act had only a brief existence. It was repealed and replaced by a new Act in the 1956 session. The purposes of this replacement were said to be the revision of the legislation in the light of experience and the simplification of administrative procedures. Included in the new Act were emergency provisions designed to counter any unforeseen threat to adequate domestic supplies by allowing the Board to

- (a) adjust the allowable rates of production of gas from any well, pool or field, or,
- (b) require the diversion of any gas intended for industrial use outside the Province to such other uses as the Board may direct.

Also, exceptions to the Act were elaborated:

Notwithstanding any other provision of this Act, the Lieutenant-Governor in Council, upon the recommendation of the Board, may, by general regulations or special orders, exclude from the application of this Act, under such conditions as may be prescribed, any special hydrocarbons that are removed or that are intended to be removed from the Province otherwise than by means of pipe lines.³²

Thus legislative action moved to deal with the rapidly developing problems of gas export and with the critical opposition to it. In spite of the opposition, the quantity exported increased from the small amounts taken by Pouce Coupe in British Columbia in 1951 to nearly 12 billion cubic feet in 1956, with the United States being the chief importer. The following table indicates the extent of market expansion:³³

TABLE 14

Disposition of Alberta Natural Gas, 1951-1956

(Quantities in M.M.C.F.)*

-
- 32. Government of Alberta, Gas Resources Preservation Act, 1956, Chapter 19, Sections 10, 24.
 - 33. Government of Alberta, Annual Review of the Oil and Gas Industry, 1951 - 1956.

The meeting had only a brief existence. It was intended to be a study of the work of the Commission. The purpose of this report was not to be the creation of the Commission in the light of the Commission and the establishment of a committee for the purpose. It was intended to be a study of the work of the Commission in the light of the Commission and the establishment of a committee for the purpose. It was intended to be a study of the work of the Commission in the light of the Commission and the establishment of a committee for the purpose.

- (a) subject the Commission to a study of the work of the Commission in the light of the Commission and the establishment of a committee for the purpose.
- (b) subject the Commission to a study of the work of the Commission in the light of the Commission and the establishment of a committee for the purpose.

Also, according to the report of the Commission:

Subjecting the Commission to a study of the work of the Commission in the light of the Commission and the establishment of a committee for the purpose. The Commission has been established in the light of the Commission and the establishment of a committee for the purpose. The Commission has been established in the light of the Commission and the establishment of a committee for the purpose. The Commission has been established in the light of the Commission and the establishment of a committee for the purpose.

The Commission has been established in the light of the Commission and the establishment of a committee for the purpose. The Commission has been established in the light of the Commission and the establishment of a committee for the purpose. The Commission has been established in the light of the Commission and the establishment of a committee for the purpose. The Commission has been established in the light of the Commission and the establishment of a committee for the purpose. The Commission has been established in the light of the Commission and the establishment of a committee for the purpose.

Page 11

Commission of the Commission, 1955-1956
 Commission of the Commission, 1955-1956

- 2. Commission of the Commission, 1955-1956
- 3. Commission of the Commission, 1955-1956

	<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954.</u>	<u>1955</u>	<u>1956</u>
Stored -	2,522	2,803	2,487	4,307	7,092	8,945
Sales in Alberta -	57,746	55,905	63,722	80,884	96,355	103,895
Imported Sales in Alberta -	---	---	3	15	31	146
Exports to B.C. -	268	406	438	540	702	927
Exports to U.S.A.-	---	8,145	9,629	7,148	11,357	10,828
Plant Fuel -	2,879	2,825	2,569	2,751	4,618	5,254
Processing Shrinkage-	3,374	4,604	4,785	5,353	6,344	6,857
Waste -	16,015	17,226	25,716	29,509	37,783	55,695
Field Use -	2,298	2,736	3,254	4,431	4,164	7,051

x Millions of Cubic Feet.

In spite of the rapidly increasing use of gas in Alberta, brought about largely by expanding industry and urban population, the exports had reached over 10 percent of total sales in 1956. By 1958, the eastern market, together with the Pacific coast area, had contracted for export from Alberta of nearly 6 trillion cubic feet over the next twenty years, thus averaging about three times the 1956 volume of export.³⁴ Unlike the demand for oil, which slumped in 1957 regardless of attempts to sell increased quantities, the gas demand is in effect limited by the amount that Alberta is felt to have in excess of her own needs.

In addition to the existing outlets, most urban centres across Canada will be supplied with natural gas from Alberta and the Peace River area of British Columbia by the end of 1958. This will be accomplished by the extension of the Trans-Canada pipeline to Montreal, and the development of

34. Edmonton Journal, February 5, 1958.

its lateral lines across the country. The Westcoast Transmission Company, in 1957 completed its line to the Pacific coast of Canada and the Northwest United States. In 1957 alone, over 2,000 miles of gathering and main transmission gas lines were laid in Canada.³⁵

Under these circumstances, it was to be expected that adjustments to pipe line legislation would be found necessary. The Pipe Line Act 1952 Amendment Act of 1957 introduced a great variety of adjustments. Included in these was a change of authority in that the Minister of Mines and Minerals took over responsibility for pipelines from the Minister of Highways.³⁶ The single definition of a pipe line is replaced by definitions of a gas line as distinct from an oil line. In the case of new oil or gas lines, the Petroleum and Natural Gas Conservation Board is required to notify the Minister of Mines and Minerals as to opinions or objections it may have regarding the line.

The tendency of the many amendments is generally to place the control and supervision of pipe lines more firmly under the control of the Department of Mines and Minerals, and the Petroleum and Natural Gas Conservation Board. This development followed logically from the emphasis being placed on conservation, and on protection of the Alberta gas consumers in the matter of gas export.

35. Government of Canada, Canada, 1958 (Ottawa, 1958), 172.

36. Government of Alberta, The Pipe Line Act 1952 Amendment Act, 1957, Chapter 66, Section 2.

CHAPTER 9

Summary

Among the first major points of discussion concerning Alberta petroleum policies was the matter of controlling the natural resources. The question as to whether it would have been better policy to have given the Province control of its resources in 1905 instead of in 1930 is extremely complex, and any conclusion could be challenged.

In 1938, the Alberta government estimated that alienations permitted by the Dominion deprived the Province of royalties on about 48.5 percent of total oil production. This estimate was based on the fact that the C.P.R. and the Hudson's Bay Company had their grants of land concentrated in the part of the Province south of the North Saskatchewan river, where most of the activity in petroleum production was taking place at that time. Considering the Province as a whole, the percentage held by the Crown is greater, as indicated in the following table:¹

TABLE 15

Comparison of Alberta Mineral Rights Held Freehold with Mineral Rights Held by the Crown.

	<u>Freehold(acres)</u>	<u>Crown(acres)</u> [#]	<u>Crown(%)</u>
In the area located south of the North Saskatchewan	15,000,000	30,000,000	67%
In the whole Province	16,000,000	147,000,000	90%

, # Includes rights reserved both to Alberta and the Dominion.

The various compensations made by the Dominion for alienation of resources were based more on an acreage and population basis than on the value of minerals. Had the extent of the oil fields, particularly in Alberta and

1. Government of Alberta, Report of Natural Gas Commission, 1949, 27.

Saskatchewan, been more fully realized at the time when the major negotiations were being undertaken, it is likely that this factor would have received more consideration.

Until the prairie provinces were sufficiently developed to administer their own affairs, the Dominion was inescapably charged with the responsibility for developing the area in the interests of the nation. For their services in this development, the C.P.R. and the Hudson's Bay Company had been granted areas of 7,873,000 acres and 1,631,000 acres respectively.² At the time, it was hardly to be expected that the Dominion could have evaluated accurately the mineral wealth which these grants actually involved.

The question as to whether the provincial control of the resources starting in 1905 instead of 1930 would have been an improvement, is subject to a variety of considerations. Supervision of resource development by a local authority rather than by a remote authority assures closer contact and better understanding of problems in the field of operation. However, the experience and general perspectives of the first Alberta administrations would likely have suffered in comparison with those of the Dominion, since the latter had had several decades in which to become familiar with the problems connected with developing new territory.

Special criticism was levelled at the Dominion for its policies of conservation with regard to petroleum and natural gas. The Alberta government brief to the 1938 Conference on Dominion-Provincial relations argued that the Dominion had no policy on conservation and that furthermore it maintained restrictions on provincial action, preventing the Alberta ad-

2. Canadian Petroleum Association, Statistical Year Book, 1956, 6.

ministration from inaugurating a conservation scheme. To the extent that this objection was valid, it was rectified by subsequent revisions to the Natural Resources Transfer Agreement, which in effect gave the Province full freedom of action in conservation. Actually, the main obstacles to conservation in the early years of provincial administration appear to have been the result of misunderstandings and differences of opinion and objective as between the Province and the operators. The government was interested in the establishing of restricted flow and prorating of production, which to many operators represented arbitrary dictation and loss of opportunity to produce economically advantageous amounts.

Thus, when the Turner Valley Conservation Board began, in 1932, the application of its legislated conservation powers, it was challenged, not by the Dominion, but by the operators.

Because of this situation, it can be argued that waste, in the sense of unnecessary losses, occurred. Much of the waste referred to in the first years of provincial administration was perhaps unavoidable if development was to proceed. Inadequate markets for gas, together with incomplete knowledge of conservation techniques such as repressuring, combined with the inferior technology of those days to bring losses which would not be incurred under present conditions. Such losses must be balanced against an estimate of the losses which would have occurred if no production had taken place at that time.

If it could be argued from this, therefore, that the early policies achieved the maximization of social benefits over time, then by our definition, minimum waste and optimum conservation would have been achieved.

However, as Ciriacy-Wantrup points out in his analysis, "...any state

of conservation may be called 'wasteful' if not based on best knowledge."³ And in the early thirties, best knowledge was not being used in Alberta because the measures which the government knew should be applied were not applied. To some extent, this was a shortcoming of the early conservation statutes, which set out to achieve some measure of unified operation in the oil fields by seeking voluntary agreement among operators without full recognition of the factors which ensured hostility to such attempts. These factors included the assumption by many operators that when they struck oil or gas they would be permitted to produce at maximum flow, and for many, such maximum flow was needed to cover costs and to ensure a return on investment. Under such circumstances, it was hardly practical to expect acceptance of the severe curtailment of flow which conservation engineering required.

This situation was set forth very well by the McGillivray Commission in 1938. This report pointed out that the evils of the "Rule of Capture" could not be entirely overcome by prorationing, because the motivation still remained to drill excessively in order to take oil from neighbouring land, and as more wells were drilled, allowables for each would be reduced. The restricted production made overhead costs more formidable. Also, some operators were encouraged to drill excessively in order that their prorated allowables would be sufficient to meet their refinery commitments.

These problems were centred around Turner Valley, where unorganized development was well advanced, and the matter of equities was an important factor which had to be balanced against the general losses which were being incurred as a result of unrestricted output. The annual reports of the

3. S. V. Ciriacy-Wantrup, Resource Conservation, Economics and Policies (Berkeley and Los Angeles, 1952), 57.

government throughout the 1930s indicate that the officials concerned were far from satisfied with the results of the compromise policies which they attempted.

Both the operators and the government gradually adjusted to the circumstances. At first, there was some litigation against the government's rulings, but with little success. On the other hand, the McGillivray Commission criticized the "dictatorial powers" of the Board under the 1931 Oil and Gas Wells Act, and the 1938 Oil and Gas Resources Conservation Act. It was recommended that both these Acts be repealed. Consultation with the industry in drafting new legislation was asked. Definitions of terms, such as "waste" were required. Clearer statements of Board powers and of appeal methods were suggested. To some extent these recommendations were achieved in subsequent legislation.

In spite of consistent recognition of the desirability of unit operation in new fields, where the conflicts of equity were not yet a factor, this method did not develop significantly when new discoveries were made outside Turner Valley. To some extent, acreages under a single management were increased by the policy of greatly extending the maximum areas permitted to any one applicant for prospecting and development. At the same time, complete monopoly of new fields was checked by the establishment of the Crown reserve system, whereby the holder of a petroleum and natural gas reservation could lease only half of the acreage in any township.

By 1946, some voluntary unit operations were in effect, but on a very small scale. More agreements were reported in 1956. But by 1958, a Saskatchewan plan by four major oil companies for unit operation in conjunction with an experimental water flood project was unusual enough to be considered newsworthy in Alberta oil circles. "...the interested companies felt that

by unitization, equitable sharing of know-how, equipment and labor forces could be achieved."⁴ This, in effect, was what Alberta government advisers were saying in 1930.

Perhaps in an attempt to stimulate voluntary unitization, the Alberta-government in 1957 passed legislation permitting government enforcement of such unitization, with only proclamation being required to put the legislation into effect. At the same time agreements for unit operation were announced in an area near Jumping Pound, northwest of Calgary, in a section of the Acheson pool near Winterburn, and in the Westeros field south of Leduc. It still remains to be seen whether the example of these groups will become widespread before the government feels obliged to use compulsion.

Severe criticisms of Alberta petroleum and natural gas policies arose over the questions of gas gathering and gas export. The main points of criticism arose over possible lack of adequate future supplies of gas for Alberta, possible excessive prices to local consumers, and possible lack of adequate government control over the gas gathering system in the Province.

Since the initial controversies, the matter of future supplies for the Province has become less urgent. In 1949, when the question was first getting serious consideration, the highest estimate made by the Dinning Commission was an aggregate Alberta withdrawal of 12.23 trillion cubic feet of gas over the following fifty years.⁵ Nine years later, the Petroleum and Natural Gas Conservation Board estimated the Province's potential reserves at 60 to 80 trillion cubic feet. Such developments, combined with the fact

4. Edmonton Journal, July 22, 1958.

5. Government of Alberta, Report of Natural Gas Commission, 1949, 122.

that practical use of nuclear energy is now much more tangible, tend to weaken the arguments that local fuel shortages will arise.

However, controversy is still high over the pricing of natural gas. Exporting companies say that export, by cutting overhead costs, can actually reduce prices to local consumers. Critics point to such price differentials as 22 cents per Mcf for Canadian gas to American consumers, while Canadian consumers across the border pay at least 10 cents more. Producers justify this on the basis of volume used. Officials of Westcoast Transmission Company have told the Borden Energy Commission that United States consumers have agreed to take twice the volume of gas daily as will be taken by those in British Columbia. The proportional transportation costs allocated to the latter would therefore be 44 cents per Mcf, whereas the cost to the United States would be "about 21½ cents."⁶ The chairman of the Borden Energy Commission replied by saying that the 22 cents being charged the American buyer was "far too low." As yet this issue is far from settled.

The question of government control over the Alberta gas gathering system cannot be judged entirely by the fact that the Alberta government was greatly outnumbered in voting shares and in directors. By having such representation, the government achieved what was probably its main purpose, to have inside contact with the affairs of the system. With such information, the need for direction or control can readily be ascertained, and it would seem that ample power exists in other Acts concerning petroleum and natural gas to enable the necessary control to be effected.

Preceding chapters have not attempted to deal with the implications of

6. Edmonton Journal, February 19, 1958.

marketing policy on the petroleum industry, although the effect of available markets on production and conservation has been indicated. The current market slump due to world market fluctuations has brought forth criticism of development policies by which new drilling and development have received great encouragement. It has been argued that if less new drilling had been done in the last few years, the capacity of fields already in production would now be more fully utilized, leading to economies in production costs. This would imply that the government should have been able to forecast correctly the current developments in the world petroleum market.

Such a situation emphasises the fact that some of the factors entering into decisions as to production, conservation, exploration and marketing policies are necessarily based on estimates which may include a considerable amount of guesswork.

The best policy in any case will probably be the one which eliminates guesswork as far as possible, using instead the most advanced available technological and scientific information. This standard certainly appears to have been achieved by the Alberta Natural Gas Commission of 1949, since its conclusions have to a large extent been validated by subsequent developments, and while its estimates of future reserves, for example, were somewhat conservative, this tendency leaned toward the protection of future Alberta supplies, which was one of the Commission's responsibilities.

The many changes and amendments in Alberta legislation pertaining to petroleum and natural gas might lead to the interpretation that incompetence was involved. However, it is true of the best legislation that practical experience with it will indicate improvements, even when conditions remain stable. With rapidly changing conditions such as have occurred in the Alberta petroleum history, legislative adjustments become imperative.

The need for restricted production in the 1930s changed abruptly to the need for maximum wartime output. The condition of declining southern fields being the main source of supply was suddenly reversed with the new northern discoveries. The vast new supplies of oil and gas changed the Province from the status of importer to that of an eager exporter. New techniques of exploring, drilling, repressuring, and conservation greatly altered the regulatory requirements. Under such conditions, the surest sign of incompetence would have been static legislation. This is not to imply that all of the legislation was perfect at the time it was passed, or that some of the many amendments could not have been avoided. But it does indicate the certainty that many and frequent changes were essential, and that avoidance of inadequacies often would have required an ability to foresee the future which cannot be expected of an average legislator.

The current marketing difficulties, which affect almost every aspect of petroleum and natural gas policy, are an example. Policy in such cases must often be based on psychological and political factors, both national and international, which are quite beyond the control and estimations of a provincial authority. In such cases the legislation must often be largely an adjustment to circumstances as they arise.

BIBLIOGRAPHY

Books

- American Geographical Society, World Geography of Petroleum, Princeton, 1950.
- Ball, Max W., This Fascinating Oil Business, Indianapolis and New York, 1940.
- Brown, H., Bonner, J., Weir, J., The Next Hundred Years, New York, 1957.
- Ciriacy-Wantrup, S.V., Resource Conservation, Economics and Policies, Berkeley and Los Angeles, 1952.
- De Golyer, E. (ed.) Elements of the Petroleum Industry, New York, 1940.
- Funk and Wagnalls, Universal Standard Encyclopedia, New York, 1954.
- Hopkins, C., The Canadian Annual Review, Toronto, 1920-1929
- Lewis, D., Thompson, R., Canadian Oil and Gas, Toronto, 1958.
- Martin, Chester, The Natural Resources Question, Winnipeg, 1920.
- Maxwell, J. A., Federal Subsidies to the Provincial Governments in Canada, Cambridge, 1937.
- Shuman, R. B., The Petroleum Industry, Norman, Oklahoma, 1940.
- Smith, G. H., (ed.) Conservation of Natural Resources, New York and London, 1950.
- Uren, L.C., Petroleum Production Economics, New York, Toronto, and London, 1950.

Government Documents and Publications

Government of Canada

- Canada Year Book (annual)
- Canada, 1958.
- Canada Gazette, vol. xlvii, and vol. xlv.
- Dominion Statutes, 1909, Chapter 27, and 1921, Chapter 23.
- The Economic Background of Dominion-Provincial Relations, Ottawa, 1939.
- Report of the Royal Commission on the Natural Resources of Alberta, Ottawa, 1935.
- Report of the Royal Commission on Dominion-Provincial Relations, Ottawa, 1940.

Government of Alberta

Annual Reports, Department of Lands and Mines, and Department of Mines and Minerals, 1930-1957.

Annual Review of the Oil and Gas Industry, 1951-1956.

Alberta Oil and Gas Industry, Calgary, 1955 and 1957.

Alberta's Oil Industry, Edmonton, 1940.

Alberta's Oil and Gas Conservation Act and Conservation Board, Edmonton, 1957 (mimeographed).

Orders-in-Council, Department of Lands and Mines, and Department of Mines Minerals.

Organization Chart, Department of Mines and Minerals, Edmonton, 1957.

Report of Alberta Coal Commission, Edmonton, 1925.

Report of Natural Gas Commission, Edmonton, 1949.

Submission to the Royal Commission on Energy, Department of Mines and Minerals, Calgary, 1958.

Synopsis of Statutes of General Application, 1944-1957.

Statutes of Alberta, 1926 - 1957.

The Case for Alberta, Edmonton, 1938.

The History of Alberta Oil, Edmonton, 1940.

Government of California

Oil and Gas Conservation Act, 1915, Chapter 718 and amendments.

Great Britain

Imperial Statutes, 1930, Chapter 26.

Articles

Beach, F.K., "Alberta's Petroleum Paternity", Canadian Oil and Gas Industries, January - April, 1956.

Beach, F.K., "An Engineer Looks at the Law", ibid., June 1954.

Millard, Vernon, "Proration to Market Demand," Calgary, 1952 (mimeographed).

Continuation of list

General Summary, Department of Public Health, and Department of Social Services, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Continuation of list

Annual Report of the U.S. Public Health Service, 1917-1918.

Index

Annual Report of the U.S. Public Health Service, 1917-1918.

Index

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Annual Report of the U.S. Public Health Service, 1917-1918.

Newspapers and Periodicals

Canadian Petroleum Association, Statistical Year Book, 1956.

Edmonton Bulletin.

Edmonton Journal.

The Oil and Gas Journal, March 17, 1958.

University of Alberta Library



0 1620 1096 7949

B29778